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Nexus of Thai Health Sciences (NTHS) aims to disseminate scholarly work and study findings in the integration of health sciences, with an emphasis on system- and policy-level research on health systems, interprofessional approaches, and the integration of knowledge across disciplines, in order to support the sustainable development and transformation of Thailand's health system and to advance the work of Thai public health and medical personnel, both nationally and internationally, as well as interested members of the public.

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Nexus of Thai Health Sciences
Vol. 1 No. 1 January – February 2026

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Nexus of Thai Health Sciences (NTHS) welcomes submissions in the health sciences related to health systems research, health policy analysis, interprofessional practice, digital health, epidemiology, health economics, and related fields, with an emphasis on work that contributes to the development and transformation of Thailand's health system at the system and policy levels. Manuscripts must not have been published elsewhere previously and must not be under consideration by another journal. The criteria and guidelines are as follows:

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Academic articles present knowledge, concepts, or academic experience in the health sciences, with analysis, synthesis, and reference to reliable empirical evidence. They comprise an introduction, main content, conclusion, and references.

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Policy analysis articles systematically analyze health policies or measures using empirical evidence and appropriate conceptual frameworks. They comprise an introduction and background to the policy issue, the analytical framework or method, analysis results, policy options and recommendations, conclusion, and references.

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- Use TH Sarabun New font, 16 points, with 2.54 cm margins on all sides.
- Length must not exceed 15 pages, including tables, figures, and the reference list.

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Title: The title should be short, concise, and informative, consistent with the objectives and content, and provided in both Thai and English, without abbreviations.

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Abstract: Write in both Thai and English, not exceeding **300** words per abstract, as continuous prose without sub-headings. Cover the background and objectives, methods, results, and conclusions; report only the key statistics; and include no citations in the abstract.

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Introduction: Describe the background and significance of the problem, the situation, related research, the gap in knowledge, and the rationale for the study.

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Acknowledgments (if any): Identify those who provided assistance, supporters, and sources of research funding.

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The journal uses the Vancouver referencing style. Reference numbers are placed in square brackets [ ] at the end of the statement being cited. Number 1 is used for the first source cited, and numbering continues in the order in which sources appear in the text. A source that is cited again keeps its original number. All references are listed at the end of the article. Authors are responsible for the accuracy of their references. For works with more than 6 authors, list the first 6 authors followed by “et al.”

4.1 Journal Articles

Author(s). Article title. Journal title. Year of publication;Volume(Issue):First page-Last page.

1. Nualnet P, Somboon O. Development of the primary health care system in rural communities [in Thai]. Journal of Thai Public Health. 2023;18(3):112-128.
2. Muangsapaya W, Winichagoon P, Fucharoen S, Pootrakul P, Wasi P. Improved technique for detecting intraerythrocytic inclusion bodies in thalassemic trait. J Med Assoc Thai. 1985;68:43-5.

4.2 Books

Author(s). Book title. Edition. Place of publication: Publisher; Year of publication.

1. Ativanichayaphong N. Health policy and the Thai health service system [in Thai]. Bangkok: Thammasat University Press; 2022.
2. Gilstrap LC, Cunningham FG. Operative obstetrics. 2nd ed. New York: McGraw-Hill; 2002.

4.3 Book Chapters

Author(s). Chapter title. In: Editor(s), editor. Book title. Place of publication: Publisher; Year of publication. p. First page-Last page.

1. Wood WG. Hemoglobin analysis. In: Weatherall DJ, editor. The thalassemias. New York: Churchill Livingstone; 1983. p. 31-53.

4.4 Electronic Sources and Articles with a DOI

Author(s). Article title. Journal title [Internet]. Year of publication [cited Year Month Day];Volume(Issue):Pages. Available from: URL

1. Annas GJ. Resurrection of a stem-cell funding barrier--Dickey-Wicker in court. N Engl J Med [Internet]. 2010 [cited 2010 Jun 15];363:1687-9. Available from: http://www.nejm.org/doi/pdf/10.1056/NEJMp1010466
2. Degenhardt L, Bohnert KM, Anthony JC. Assessment of cocaine and other drug dependence in the general population. Drug Alcohol Depend [Internet]. 2008 Mar [cited 2010 Apr 15];93(3):227-32. doi:10.1016/j.drugalcdep.2007.09.024

4.5 Theses and Dissertations

Author(s). Title [Type/degree level]. Place of publication: University; Year the degree was awarded.

1. Srichairattanakool A. Comparison of the quality of life of patients with chronic myeloid leukemia in the chronic and blastic phases [master's thesis]. Bangkok: Chulalongkorn University; 2000.

5. Manuscript Submission

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- Authors revise their articles according to the suggestions of the reviewers and the editorial board within the specified time, and follow the review outcome through the online system.

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8.4 Ethics of Research Involving Humans

Research articles involving humans must be approved by a human research ethics committee, and the certificate number and the name of the committee must be stated in the article. The research must

be conducted in accordance with the principles of the Declaration of Helsinki, with informed consent obtained from every participant, and personally identifiable data must be strictly protected.

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EDITORIAL

Nexus of Thai Health Sciences (NTHS), Vol. 1 No. 1 (January – February 2026), presents research from local health service units, showing that sustainable health system development begins with solving real problems at the point of care. The articles in this issue are original research articles with a shared emphasis on developing models and systems of patient care that are safe, continuous, and appropriate to the local context, ranging from immunization promotion and chronic disease care in the community, to care for mothers at risk during labor and the postpartum period, to the management of isolation patients and participatory patient care in hospitals.

The work in this issue falls into three main themes. The first is community health care and immunization promotion, comprising the development of an immunization promotion model for older adults and vulnerable groups using the “Mor Saleng” innovation, and the development of a care model for patients with uncontrolled diabetes in the area of a subdistrict health promoting hospital. The second is safe and continuous care for mothers at risk, comprising the development of a referral model for mothers in preterm labor to address delayed referral, and the development of a discharge planning model for postpartum mothers who use methamphetamine. The third is the development of hospital service systems, comprising the development of an isolation patient management model in the inpatient ward and the development of a participatory patient care model using homeopathic medicine.

Taken as a whole, the editorial board sees this research as consistent with the spirit of the name “Nexus”: a journal that serves as a point of connection among practitioners in the field, researchers, and policymakers. Each study begins with a problem in the real context of a hospital or community and leads to a model or system that other service units can study and adapt. Every article in this issue was screened by at least 3 expert reviewers through double-blind peer review to ensure academic quality and credibility, and the journal is published as open access so that all readers can access this knowledge free of charge. The editorial board sincerely hopes that the knowledge in these articles will benefit the development of health services, administration, and health policy-making, and can be applied concretely in readers’ own work contexts.

Sergeant Arthawit Noenchard
Executive Editor
Nexus of Thai Health Sciences

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RESEARCH ARTICLE

Development of an Immunization Promotion Model for Older Adults and Vulnerable Groups Using the “Mor Saleng” Innovation in the Community Area of Kalasin Hospital

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Citation: Chaisongkram S. Development of an immunization promotion model for older adults and vulnerable groups using the “Mor Saleng” innovation in the community area of Kalasin Hospital. Nexus of Thai Health Sciences. 2026;1(1):1-13.

Abstract

This research and development (R&D) study aimed to 1) examine the situation and problems of immunization among older adults and vulnerable groups, 2) develop an immunization promotion model using the “Mor Saleng” innovation, and 3) evaluate its effects. It was conducted in Kalasin Municipality from January 2024 to December 2025 in three phases: situation analysis, participatory action research, and a quasi-experimental two-group pretest–posttest design with communities allocated by lottery. Participants were 140 older adults and vulnerable individuals (70 per group) and 30 key informants. Instruments included the SALENG Model, vaccine health literacy and vaccine attitude–confidence questionnaires, and vaccination records. Data were analyzed using paired and independent t-tests, the chi-square test, and content analysis.

The SALENG Model comprised six components: individual survey and screening, active outreach by saleng (motorized tricycle), health literacy and rumor management, community engagement through the three-doctor mechanism, network monitoring, and vaccine safety assurance. After the intervention, the experimental group had significantly higher vaccine health literacy (33.18±3.56) and attitude–confidence scores (41.57±4.26) than before and than the control group ($t = 14.48$ and 11.24, p-value <0.001). Uptake of influenza vaccine (87.14% vs. 54.29%; RR = 1.61) and COVID-19 booster (77.14% vs. 38.57%; RR = 2.00) was also significantly higher (p-value <0.001). Area-level influenza vaccine coverage among older adults increased from 38.46% to 71.35%, and no serious adverse events were reported among 6,981 doses. The model should be extended to similar settings and evaluated in a cluster randomized trial.

Keywords: Immunization, Vaccine, Older adults, Vulnerable groups, Mor Saleng

Introduction

Vaccine-preventable respiratory infections, particularly influenza and coronavirus disease 2019 (COVID-19), remain major global public health problems. The World Health Organization estimates that seasonal influenza causes approximately 3–5 million cases of severe illness and approximately 290,000–650,000 deaths annually, mostly among older adults and people with underlying conditions.1 The WHO therefore designates lifelong immunization as a key strategy under the Immunization Agenda 2030.2 In Thailand, the Department of Disease Control, together with the National Health Security Office, provides seasonal influenza vaccination for seven at-risk groups (the "608" group)3 and recommends COVID-19 booster vaccination alongside it.4 However, vaccine coverage in many areas remains below target.5

Kalasin Municipality, which falls under the responsibility of Kalasin Hospital, has 36 communities, mostly commercial-building districts, housing estates, and government offices, while the outskirts are lowlands. Residents work as hired laborers, regular employees, and farmers. There are approximately 6,850 older adults and approximately 4,320 vulnerable people with chronic diseases. Data from the Health Data Center (HDC) system of Kalasin Province for 2023 showed influenza vaccine coverage among older adults of only 38.46% and COVID-19 booster coverage of only 12.35%. The key problems were that older adults and bedridden patients have difficulty traveling; working-age caregivers must work in the fields and fear losing income; some relatives do not allow older adults to be vaccinated; and there are concerns arising from rumors about vaccine safety. Facility-based services alone therefore cannot reach the target groups comprehensively.

Vaccination decisions are influenced by vaccine hesitancy, which arises from confidence, complacency, and convenience of access to services.6 Misinformation and safety concerns are key factors found worldwide.7 The concept of health literacy indicates that the ability to access, understand, appraise, and use health information helps individuals make appropriate decisions.8,9 This is consistent with the health belief model, which explains that reducing perceived barriers and increasing perceived benefits promotes disease-preventive behavior.10 A systematic review found that home visits and proactive outreach services increased vaccine coverage among older adults.11 From October 2020 to September 2022, Kalasin Hospital invented the "Mor Saleng" innovation, using a saleng (a motorcycle with a sidecar) to deliver proactive COVID-19 vaccination in the fields, at bedridden patients' homes, and at older adults' homes, which reached hard-to-reach groups well. However, it had not been developed into a systematic model, did not cover other adult vaccines, and lacked evaluation with a clear research methodology. In addition, most previous studies were conducted in health facilities, and few studies have developed proactive models that use local resources and integrate the three-doctor mechanism in community contexts in northeastern Thailand.

The researcher therefore developed an immunization promotion model for older adults

and vulnerable groups by building the Mor Saleng innovation into a system, with the participation of physicians, multidisciplinary teams, community leaders, village health volunteers (VHVs), and the public. The findings will provide guidance for increasing vaccine coverage and reducing the severity of and deaths from vaccine-preventable diseases, and will serve as a prototype for areas with similar contexts.

Research Objectives

1. To study the situation and problems of immunization among older adults and vulnerable groups in the community area of Kalasin Hospital
2. To develop an immunization promotion model for older adults and vulnerable groups using the "Mor Saleng" innovation, and to evaluate its appropriateness, feasibility, and area-level performance
3. To evaluate the effects of the model on vaccine uptake (primary outcome), vaccine health literacy, and vaccine attitude and confidence among older adults and vulnerable groups

Methods

This was a research and development (R&D) study conducted in Kalasin Municipality from January 2024 to December 2025, in three phases as shown in Figure 1. Phase 1 analyzed the situation and problems (January–June 2024) using HDC data, three focus group discussions, and 12 in-depth interviews. Phase 2 developed the model through participatory action research following the PAOR cycle (Plan–Act–Observe–Reflect) in two cycles12 (July–December 2024), three months per cycle. Phase 3 evaluated the model using a quasi-experimental two-group pretest–posttest design, with communities allocated by lottery (cluster allocation) (January–December 2025). The 12-week program based on the model was implemented from May to July 2025, coinciding with the annual influenza vaccination campaign. Details are as follows:

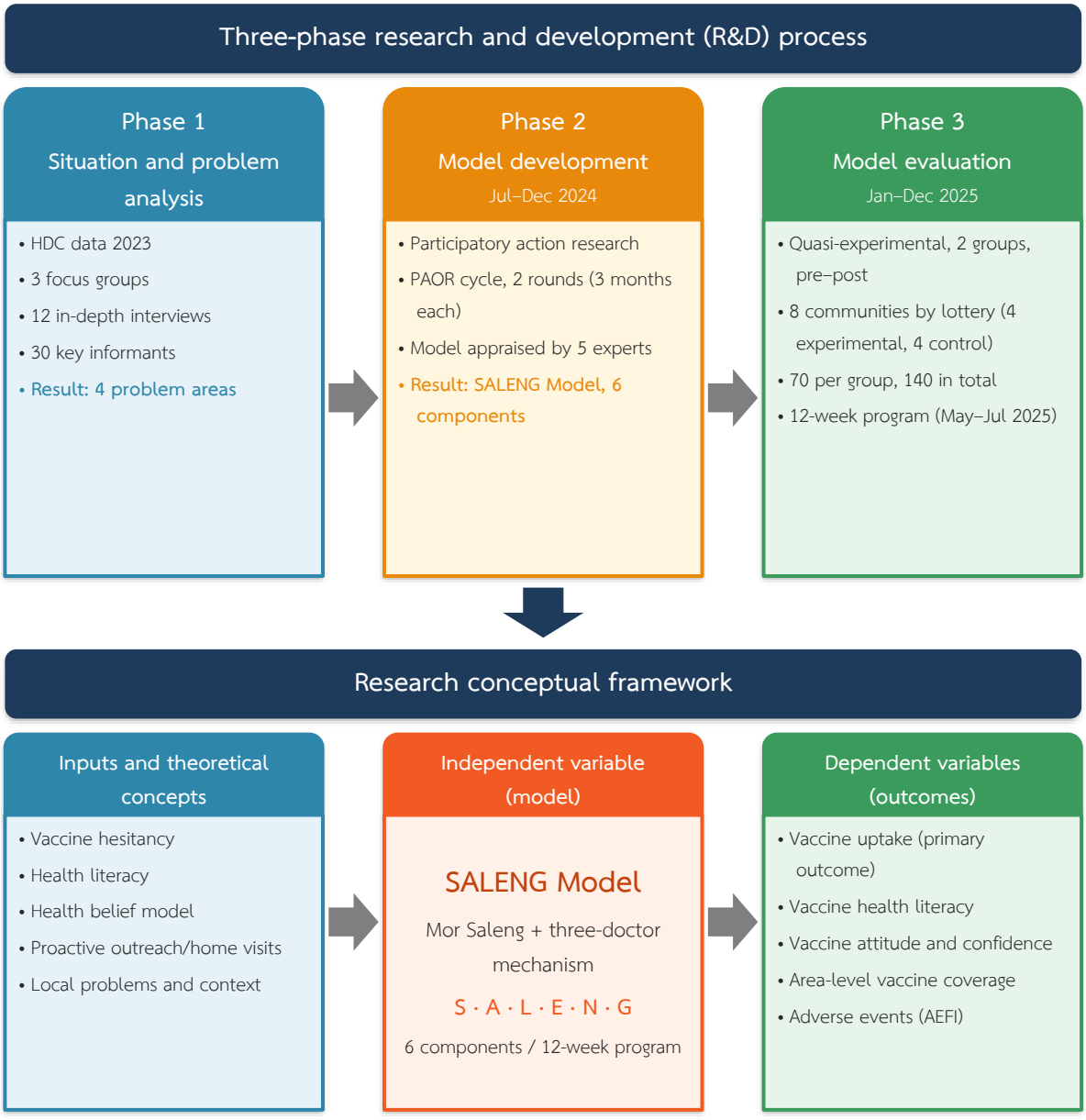


Figure 1 Three-phase research and development process and research conceptual framework

Population

Older adults aged 60 years and above and vulnerable groups, comprising patients with chronic diseases in the 6 0 8 group, bedridden and homebound patients, and persons with disabilities who cannot help themselves, living in the 36 communities in 2024–2025, approximately 11,170 people (6,850 older adults and 4,320 patients with chronic diseases aged under 60 years, counted separately without overlap).

Sample

1) Key informants in Phases 1–2: 30 people selected by purposive sampling, comprising physicians and multidisciplinary staff (8), community leaders (6), VHVs (10), and caregivers of older adults (6); and 2) the Phase 3 sample, calculated with G*Power13 for an independent t-test (two-tailed) with an effect size of 0.50, a

significance level of .05, and power of .80, giving 64 per group. Allowing for approximately 8.5% attrition [64/(1−0.085) = 69.9], 70 per group were required, for a total of 140. The design effect from cluster sampling was not adjusted.14 Multistage sampling was used: 8 of the 36 communities were selected by simple random sampling, then allocated by lottery into 4 experimental communities and 4 control communities with similar contexts that were geographically distant from one another; then approximately 17–18 people per community were selected by simple random sampling from the registry of target individuals who had not yet received vaccination that season. Control communities withheld proactive outreach services during the 12 weeks and received services after the study ended.

Inclusion Criteria

1) Aged 60 years or older, or a patient with a chronic disease in the 608 group; 2) residing in the area for at least 6 months; 3) not yet vaccinated against influenza in the 2025 season (COVID-19 booster status before the intervention was also recorded); 4) able to communicate in Thai or Isan, or having a caregiver who provides information on their behalf; and 5) willing to provide consent to participate in the research.

Exclusion Criteria

Contraindications to vaccination, such as a history of severe allergy to a vaccine or its components. Discontinuation criteria: acute illness requiring hospitalization, relocation out of the area, or withdrawal.

Research Instruments

The instruments comprised 1) the SALENG Model and its operating manual, a saleng equipped with cold-chain maintenance equipment, a basic life support kit, and materials for building health literacy and addressing rumors; 2) a general information questionnaire, a 20-item vaccine health literacy test (0–2 points per item; maximum score 40), and a 10-item vaccine attitude and confidence scale (5-point rating scale; maximum score 50), interpreted using Bloom's criteria: high (80% or above), moderate (60–79%), and low (below 60%); 3) a vaccination record form based on the MOPH Immunization Center database; 4) a model appropriateness and feasibility assessment form for experts, a 10-item client satisfaction questionnaire (5-point rating scale; mean 4.51–5.00 interpreted as the highest level), and an adverse events following immunization (AEFI) surveillance form; and 5) a focus group guide. Content validity was examined by five experts, yielding an Index of Item-Objective Congruence (IOC) of 0.67–1.00 and a Content Validity Index (CVI) of 0.92.15 A try-out with 30 people from a similar group yielded Cronbach's alpha coefficients of 0.86 and 0.89, respectively.

Data Collection

The researcher and research assistants, who were community mentor nurses not involved in delivering the program, interviewed participants using the questionnaires before the intervention (week 1) and after the intervention (week 12). Vaccination status was verified from the database at the end of the program, and area-level vaccine coverage was compiled from annual HDC data. Qualitative data were collected through focus group discussions and in-depth interviews, audio-recorded and transcribed verbatim until data

saturation. Trustworthiness was established through data source triangulation.

Data Analysis

Quantitative data were analyzed using frequency, percentage, mean, and standard deviation. Normality was checked with the Kolmogorov-Smirnov test. Mean scores were compared within groups using the paired t-test and between groups using the independent t-test, with Cohen's d effect sizes reported. Vaccination proportions were compared using Pearson's chi-square test together with the risk ratio (RR) and the difference in proportions with 95%CI, and the trend in area-level coverage was tested using the chi-square test for trend. The significance level was set at .05. Qualitative data were analyzed using content analysis.

Research Ethics

This study was approved by the Human Research Ethics Committee of [institution name], No. [project number], dated [day month year], before data collection. The researcher explained the objectives, procedures, benefits, and risks to participants. Participants signed informed consent; for older adults who could not help themselves, caregivers signed on their behalf. Data were kept confidential and presented in aggregate. Participants could withdraw at any time without any effect on their access to services, and the control group received routine vaccination services and also received proactive services after the study ended.

Results

1. Situation and problems of immunization among older adults and vulnerable groups

The 30 key informants comprised physicians and multidisciplinary staff (8), community leaders (6), VHVs (10), and caregivers of older adults (6). Four major problems were identified: 1) Access to services: older adults, bedridden patients, and people with underlying conditions had difficulty traveling to the hospital for vaccination; 2) Economic factors: working-age caregivers had to work in the fields and feared losing income; 3) Beliefs and information: rumors about adverse events and deaths from vaccines led relatives to refuse permission for older adults to be vaccinated; and 4) Service system: proactive services outside health facilities lacked clear guidelines on legal requirements, cold-chain maintenance, and workforce allocation. Baseline data for 2023 showed influenza vaccine coverage of 38.46% among older adults and 41.20% among vulnerable groups with chronic diseases.

2. Development of the immunization promotion model using the Mor Saleng innovation

2.1 Components of the SALENG Model

From two cycles of action research, a model with six components was developed: S: Survey & Screening, individual survey and screening of the target group together with VHVs; A: Active outreach, proactive services using the saleng to reach bedridden patients' homes, older adults' homes, fields, village halls, and temples; L: Literacy, building health literacy and addressing rumors at

every outreach visit; E: Engagement, participation through the three-doctor mechanism; N: Network monitoring, monitoring community-level coverage through the meetings of subdistrict headmen and village headmen, VHV meetings, and District Health Coordinating Committee (DHCC) meetings; and G: Guarantee of safety, cold-chain maintenance, pre-vaccination screening, and AEFI surveillance, as shown in Figure 2. In cycle 1, problems of relatives' refusal and working-age people being away from home persisted during the first 3 months. In cycle 2, therefore, outreach times were adjusted to early morning and evening, services were delivered in the fields and village halls, and community leaders and VHVs made appointments and followed up; the model was then organized as a 12-week program, as shown in Table 1.

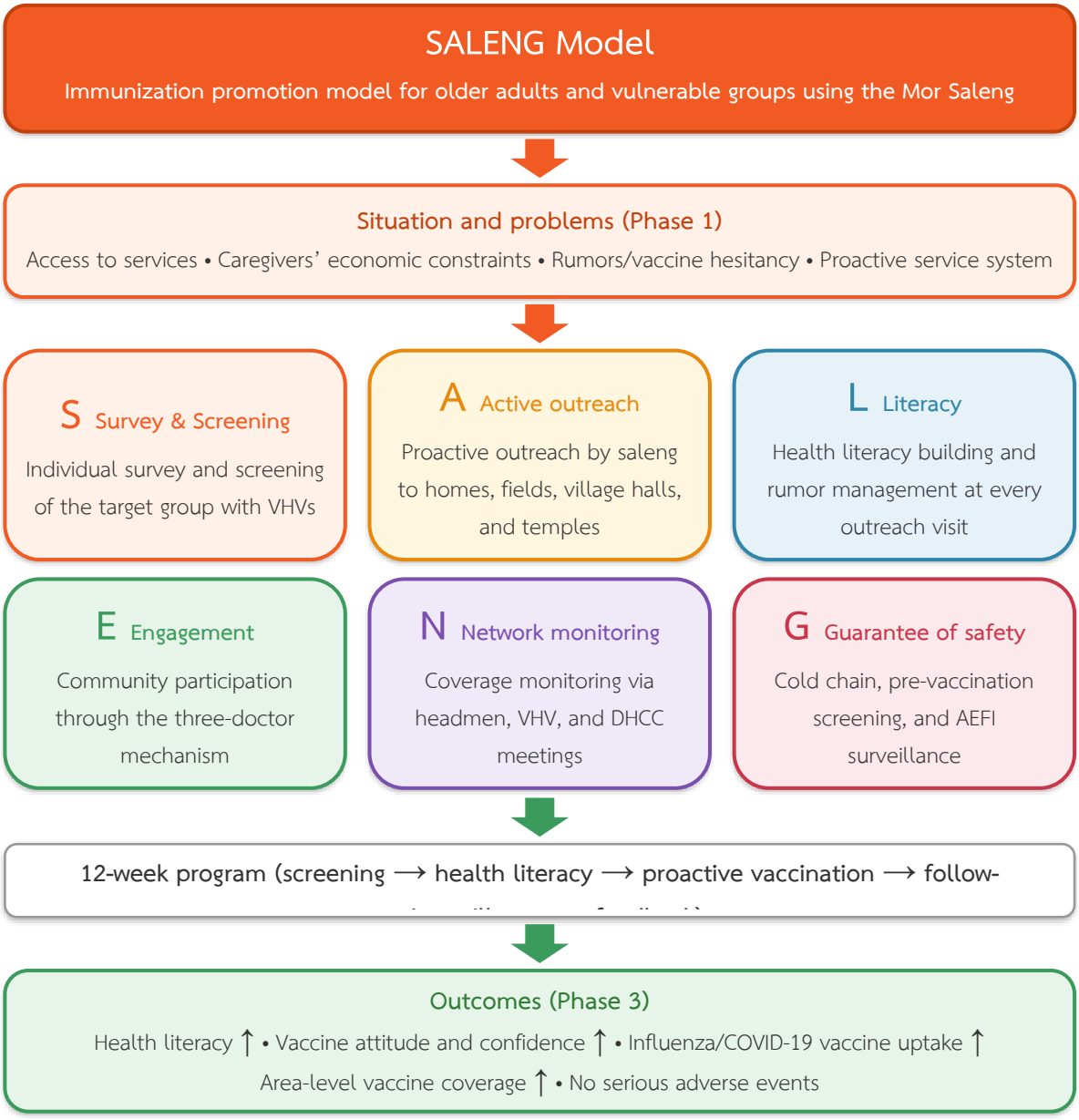


Figure 2 Immunization promotion model using the Mor Saleng innovation (SALENG Model)

Table 1 Activities of the program based on the SALENG Model (12 weeks)

Week	Activities/content	Tools used	Duration	Academic rationale
1	Individual survey and screening (S) with VHVs and community leaders; preparation of a registry and household map	Registry, community map, contraindication screening form	120 minutes	Home visits increase access for hard-to-reach groups11
2–3	Health literacy building and rumor management (L) through village hall forums, the village broadcasting tower, and LINE groups	Leaflets, Isan-language video clips, Q&A set	60 minutes/session	Health literacy8,9; health belief model10
4–8	Proactive vaccination by the Mor Saleng team (A), led by physicians, the multidisciplinary team, and VHVs	Saleng, 2–8 °C temperature-controlled box, resuscitation kit	3–4 hours/visit	Reducing convenience barriers6,11
9–11	Follow-up, catch-up, and AEFI surveillance (E, G)	AEFI follow-up form, three-doctor LINE group	30 minutes/person	Community participation
12	Evaluation, feedback of community-level coverage at the meetings of subdistrict headmen, village headmen, and VHVs, and lessons-learned review (N)	Questionnaires, vaccine database	120 minutes	Monitoring through community networks

2.2 Quality of the model and area-level performance Five experts rated the appropriateness of the model at the highest level ($\bar{x}$ = 4.52, S.D. = 0.48) and its feasibility at the highest level ($\bar{x}$ = 4.46, S.D. = 0.51). The Mor Saleng team conducted 312 proactive outreach visits, administering a total of 6,981 doses (2,856 doses in 2024 and 4,125 doses in 2025; 4,412 influenza vaccine doses and 2,569 COVID-19 vaccine doses), and delivered health literacy and rumor management activities in all 36 communities. Influenza vaccine coverage among older adults increased from 38.46% in 2023 to 58.72% in 2024 and 71.35% in 2025 (chi-square test for trend = 1,503.67, p-value <0.001, using 6,850 older adults as the denominator every year), while coverage among vulnerable groups with chronic diseases increased from 41.20% to 63.45% and 74.18%, respectively. No serious adverse events were found among 6,981 doses (upper bound of the 95%CI 0.04%), and clients (experimental group, n = 70) were satisfied at the highest level ($\bar{x}$ = 4.61, S.D. = 0.42).

3. Effects of the immunization promotion model using the Mor Saleng innovation

3.1 General characteristics of the sample The experimental group was 58.57% female with a mean age of 69.84±7.12 years; the control group was 57.14% female with a mean age of 70.21±7.45 years. The most common underlying conditions were hypertension (52.86% and 51.43%) and diabetes (34.29% and 35.71%), and 15.71% and 14.29%, respectively, were homebound or bedridden. The two groups did not differ (sex χ^2 = 0.03, p-value = 0.864; age t = −0.30, p-value = 0.764; hypertension χ^2 = 0.03, p-value = 0.866; diabetes χ^2 = 0.03, p-value = 0.859; homebound/bedridden χ^2 = 0.06, p-value = 0.813). No participants discontinued (n = 70 per group), and before the intervention no one in either group had received a COVID-19 booster in the previous 12 months.

3.2 Within-group comparison After the intervention, the experimental group's vaccine health literacy score increased from 22.46±4.12 to 33.18±3.56 points (t = 20.62, p-value <0.001, d_z = 2.46) and its attitude and confidence score increased from 31.24±5.38 to 41.57±4.26 points (t = 16.88, p-value <0.001, d_z = 2.02), whereas the control group did not differ from before the intervention (t = 1.77, p-value = 0.081 and t = 1.37, p-value = 0.176), as shown in Table 2.

Table 2 Comparison of mean scores before and after the intervention by group (paired t-test, n = 70 per group)

Variable	Group	Before		After		$\bar{d}$	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.				
Vaccine health literacy (maximum score 40)	Experimental	22.46	4.12	33.18	3.56	10.72	9.68 – 11.76	20.62	<0.001*
Vaccine health literacy (maximum score 40)	Control	22.81	4.05	23.64	4.21	0.83	−0.10 – 1.76	1.77	0.081

Variable	Group	Before		After		$\bar{d}$	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.				
Vaccine attitude and confidence (maximum score 50)	Experimental	31.24	5.38	41.57	4.26	10.33	9.11 – 11.55	16.88	<0.001*
Vaccine attitude and confidence (maximum score 50)	Control	31.67	5.21	32.40	5.33	0.73	−0.34 – 1.80	1.37	0.176

*Statistically significant, p-value <.05

3.3 Between-group comparison Before the intervention, scores on both measures did not differ (t = −0.51, p-value = 0.613 and t = −0.48, p-value = 0.632). After the intervention, the experimental group's literacy score was 9.54 points higher than that of the control group (95%CI 8.24–10.84, t = 14.48, p-value <0.001, Cohen's d = 2.45) and its attitude and confidence score was 9.17 points higher (95%CI 7.56–10.78, t = 11.24, p-value <0.001, Cohen's d = 1.90), as shown in Table 3.

Table 3 Comparison of mean scores between the experimental and control groups (independent t-test)

Variable	Experimental group		Control group		$\bar{d}$	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.				
Literacy, before (maximum 40)	22.46	4.12	22.81	4.05	−0.35	−1.72 – 1.02	−0.51	0.613
Literacy, after (maximum 40)	33.18	3.56	23.64	4.21	9.54	8.24 – 10.84	14.48	<0.001*
Attitude/confidence, before (maximum 50)	31.24	5.38	31.67	5.21	−0.43	−2.20 – 1.34	−0.48	0.632
Attitude/confidence, after (maximum 50)	41.57	4.26	32.40	5.33	9.17	7.56 – 10.78	11.24	<0.001*

*Statistically significant, p-value <.05

3.4 Vaccine uptake After the intervention, 87.14% of the experimental group received influenza vaccine, higher than the control group (54.29%) (χ^2 = 18.25, p-value <0.001; RR = 1.61), and 77.14% received a COVID-19 booster, higher than the control group (38.57%) (χ^2 = 21.36, p-value <0.001; RR = 2.00), as shown in Table 4.

Table 4 Comparison of vaccine uptake after the intervention between the experimental and control groups (chi-square test)

Vaccine type	Experimental group n (%)	Control group n (%)	Difference in proportions % (95%CI)	RR	χ^2	p-value
Influenza	61 (87.14)	38 (54.29)	32.86 (18.80, 46.92)	1.61	18.25	<0.001*

Vaccine type	Experimental group n (%)	Control group n (%)	Difference in proportions % (95%CI)	RR	χ^2	p-value
COVID-19 booster	54 (77.14)	27 (38.57)	38.57 (23.51, 53.63)	2.00	21.36	<0.001*

*Statistically significant, p-value <.05

Discussion

The situation analysis found that the main barriers were access to services, economic constraints, and vaccine hesitancy arising from rumors. This is consistent with the concept that vaccination decisions depend on confidence, complacency, and convenience,6 and with a literature review finding that confidence in safety and misinformation are key factors in non-vaccination.7 In Thailand, a survey of older adults found that emphasizing the benefits of vaccines, physician recommendation, and outreach to older adults who live far away or have difficulty moving are approaches to increase influenza vaccine uptake.16 Adding service points in health facilities alone is therefore insufficient.

The SALENG Model was appropriate and feasible to implement because it was developed from the area's real problems through participatory action research.12 Using the saleng, a vehicle familiar to the community, allowed access to bedridden patients' homes, fields, and areas that cars cannot reach. This is consistent with a systematic review finding that proactive outreach and home visits increased vaccine coverage among older adults,11 and with an in-home COVID-19 vaccination program that reached homebound older adults with comorbidities and low income.17 Having physicians and the multidisciplinary team go to the field in person increased the credibility of vaccine information and allowed rumors to be addressed directly.16 Meanwhile, monitoring through the meetings of subdistrict headmen and village headmen, and having community leaders and VHVs follow up, gave the community a sense of ownership so that the burden did not fall on the hospital alone.

After the intervention, the experimental group had higher literacy, attitude and confidence, and vaccine uptake than before the intervention and than the control group. This can be explained by the fact that providing health literacy education and addressing rumors at every outreach visit developed interactive and critical health literacy,8,9 increasing perceived benefits and reducing perceived barriers according to the health belief model,10 while taking services to people's homes removed convenience barriers.6 The very large effect sizes (Cohen's d 1.90–2.45) should be interpreted in light of the limitations of measurement by questionnaires administered by local personnel.

Study limitations This was a quasi-experimental study that allocated only 8 communities as clusters, without adjustment for the design effect and without an analysis that accounts for clustering,14 so standard errors may have been underestimated. Information contamination between communities may have occurred; some data came from questionnaires, which may be biased; data collectors were not

blinded to group allocation; the follow-up period was short; and area-level coverage had no comparison area and may also have been influenced by concurrent national campaigns.

Conclusion

The problems in immunization promotion among older adults and vulnerable groups arose from barriers to access to services, economic constraints, rumors, and the service system. The SALENG Model, which uses the Mor Saleng innovation for proactive outreach together with health literacy building, participation through the three-doctor mechanism, and network monitoring, effectively increased vaccine health literacy, vaccine attitude and confidence, vaccine uptake, and area-level vaccine coverage, with no serious adverse events found.

Recommendations

1. **Recommendations for applying the findings** Multidisciplinary teams should work in the field together with community leaders and VHVs. Community leaders and VHVs should follow up on vaccine attendance, and performance should be monitored at the monthly meetings of subdistrict headmen and village headmen and of VHVs. Prepare cold-chain capacity, resuscitation equipment, and licensed professionals to supervise out-of-facility operations; allocate workforce so that routine work is not affected; and extend the model to other districts with similar contexts.

2. **Recommendations for future research** A cluster randomized controlled trial should be conducted, with the sample size calculated using the ICC, together with long-term follow-up of severe illness and mortality, cost-effectiveness analysis, and extension to other adult vaccines, such as the pneumococcal vaccine for pneumonia.

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Artificial Intelligence (AI) Disclosure

The author used an artificial intelligence tool (Claude, Anthropic) to assist in searching for sources and academic references. The author personally verified the accuracy of every reference before use. Data analysis, interpretation of results, and discussion were entirely the author's own work. The AI did not participate as a co-author.

References

1. World Health Organization. Influenza (seasonal) [Internet]. Geneva: World Health Organization; 2023 [cited 2025 Dec 20]. Available from: https://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal)
2. World Health Organization. Immunization Agenda 2030: a global strategy to leave no one behind [Internet]. Geneva: World Health Organization; 2020 [cited 2025 Dec 20]. Available from: https://www.who.int/publications/m/item/immunization-agenda-2030-a-global-strategy-to-leave-no-one-behind

3. Department of Disease Control. Guidelines for seasonal influenza vaccination services 2024 (in Thai) [Internet]. Nonthaburi: Department of Disease Control, Ministry of Public Health; 2024 [cited 2025 Dec 20]. Available from: https://ddc.moph.go.th/uploads/publish/1580020240614080923.pdf
4. National Health Security Office. NHSO board approves additional 860,000 doses of influenza vaccine for the 608 group alongside COVID-19 booster vaccination (in Thai) [Internet]. Bangkok: National Health Security Office; 2023 [cited 2025 Dec 20]. Available from: https://www.nhso.go.th/news/3990
5. Department of Disease Control. Report on seasonal influenza vaccination services 2024 (in Thai) [Internet]. Nonthaburi: Department of Disease Control, Ministry of Public Health; 2025 [cited 2025 Dec 20]. Available from: https://www.ddc.moph.go.th/uploads/publish/1693320250324062140.pdf
6. MacDonald NE; SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: definition, scope and determinants. Vaccine. 2015;33(34):4161-4.
7. Larson HJ, Jarrett C, Eckersberger E, Smith DM, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007-2012. Vaccine. 2014;32(19):2150-9.
8. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health Promot Int. 2000;15(3):259-67.
9. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, et al. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health. 2012;12:80.
10. Rosenstock IM. Historical origins of the health belief model. Health Educ Monogr. 1974;2(4):328-35.
11. Thomas RE, Lorenzetti DL. Interventions to increase influenza vaccination rates of those 60 years and older in the community. Cochrane Database Syst Rev. 2018;5:CD005188.
12. Kemmis S, McTaggart R. The action research planner. 3rd ed. Geelong: Deakin University Press; 1988.
13. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-91.
14. Campbell MK, Piaggio G, Elbourne DR, Altman DG; CONSORT Group. Consort 2010 statement: extension to cluster randomised trials. BMJ. 2012;345:e5661.
15. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. Res Nurs Health. 2006;29(5):489-97.
16. Praphasiri P, Ditsungnoen D, Sirilak S, Rattanayot J, Areerat P, Dawood FS, et al. Predictors of seasonal influenza vaccination among older adults in Thailand. PLoS One. 2017;12(11):e0188422.
17. Zhou MS, Attia C, Barnes M, Chen T, Chlada K, Doukas M, et al. Novel in-home COVID-19 vaccination program for vulnerable populations using public-private collaboration. Front Public Health. 2022;10:898787.

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RESEARCH ARTICLE

Development of a Referral Model for Mothers with Preterm Labor to Solve Delayed Referral, Namon Hospital, Namon District, Kalasin Province

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Abstract

This research and development (R&D) study aimed to 1) examine the situation and problems of referring mothers with preterm labor, 2) develop a referral model, and 3) evaluate its outcomes at Namon Hospital, Kalasin Province, from January 2024 to November 2025. All eligible participants were included: 18 registered nurses (pretest–posttest), 45 mothers with preterm labor referred before implementation (retrospective records), and 42 mothers referred after implementation. Instruments included the referral model, a three-color risk stratification tool, a knowledge test, a skill assessment form, a referral time record form, and a satisfaction questionnaire. Data were analyzed using descriptive statistics, the paired t-test, Welch's t-test, the chi-square test, and Fisher's exact test.

The NAMON Model consisted of five components: risk stratification, fast-track communication, a clinical practice guideline with checklist, staff competency development, and network collaboration with feedback. After implementation, nurses' knowledge scores increased from 12.44±2.31 to 17.22±1.48 ($t = 9.89$, p-value <0.001), and the time from referral decision to departure decreased from 52.42±12.68 to 22.64±6.15 minutes ($t = -14.08$, p-value <0.001). Timely referrals within 30 minutes increased from 20.00% to 85.71% ($\chi^2 = 34.98$, p-value <0.001; RR = 4.29), and antenatal corticosteroid use before transfer increased from 62.22% to 95.24% (p-value <0.001). Births en route decreased from 6.67% to 2.38% without statistical significance (p-value = 0.617). No deaths occurred during transfer, and maternal satisfaction was at the highest level (mean = 4.52, S.D. = 0.41). The model should be sustained and extended to other community hospitals in the network.

Keywords: Preterm birth, Referral system, Delayed referral

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Introduction

Preterm birth is a major global public health problem. In 2020, an estimated 13.4 million infants were born preterm, accounting for 9.9% of live births, essentially unchanged from 9.8% in 2010.[1] Complications of preterm birth are the leading cause of death among children under 5 years of age, with approximately 900,000 child deaths in 2019, and many surviving infants have long-term disabilities.[2] In Thailand, the reported preterm birth rate is higher than the global average: the proportion of Thai women giving birth preterm in fiscal years 2021–2023 was 12.47%, 11.61%, and 10.32%, respectively, exceeding the target of no more than 9% (Health Data Center [HDC], Ministry of Public Health).[3] Major risk factors include multiple pregnancy, insulin-treated gestational diabetes, and a history of preterm birth,[4] as well as short cervix, anemia, and a first antenatal visit after 12 weeks of gestation.[5] The World Health Organization recommends antenatal corticosteroids for women at risk of preterm birth at 24 to <34 weeks of gestation when the facility can adequately care for preterm birth and preterm newborns.[6] The WHO does not recommend routine corticosteroid use at 34 weeks of gestation or later,[6] and recommends short-term tocolysis with nifedipine at 24 to <34 weeks of gestation so that a full course of corticosteroids can be given or the referral can be completed.[7] Appropriate medication and timely referral are therefore critically important to maternal and neonatal outcomes.

In the northeastern region, studies in neighboring provinces, namely Maha Sarakham and Bueng Kan, found that preterm birth remains an important problem.[8,9] Namon Hospital, Namon District, Kalasin Province, is a 30-bed community hospital that provides obstetric services 24 hours a day and must refer mothers with preterm labor to Kalasin Hospital, approximately 30 kilometers away. Three-year retrospective data (fiscal years 2021–2023, from the referral register) showed an increasing trend of mothers with preterm labor; approximately 8–10% of all deliveries (40–50 cases per year) had to be referred to a higher-level hospital. The main problem was delay in decision-making and coordination: the time from decision to successful referral was approximately 45–60 minutes, 6–8% of mothers gave birth during transfer, and the risk of neonatal complications increased.

A referral system covers pre-referral care, care during transfer, and receiving of the referral, which requires seamless coordination in line with the concept of continuum of care together with risk management. The Three Delays model explains that adverse obstetric outcomes result from delays in decision-making, in travel, and in receiving appropriate care at the facility.[10] Delay at the referring hospital is therefore a point that the health service system can correct. This study used Donabedian's structure–process–outcome framework.[11] Previous studies have developed nursing models for pregnant women with preterm labor,[12,13] nursing practice guidelines for women with preterm labor,[14] and continuing care from hospital to home to prevent preterm birth.[15] However, most studies have focused on nursing

care within the service unit or on prevention, and few have systematically addressed delays in the referral process in community hospitals, from risk assessment, communication, and patient preparation to follow-up after referral.

The researcher therefore developed a referral model for mothers with preterm labor that is consistent with the context of Namon Hospital in order to reduce referral delay, reduce births during transfer, and improve the safety of mothers and newborns. The findings will guide professional nurses to make referral decisions quickly and can be extended to community hospitals with similar contexts, consistent with Sustainable Development Goal target 3.2, which aims to reduce neonatal mortality to no more than 12 per 1,000 live births by 2030.[16]

Research Objectives

1. To examine the situation and problems of referring mothers with preterm labor at Namon Hospital
2. To develop a referral model for mothers with preterm labor to solve delayed referral
3. To evaluate the outcomes of the model, namely timely referral within 30 minutes (primary outcome), referral time, nurses' knowledge and skills, receipt of corticosteroids, births during transfer, neonatal complications, and maternal satisfaction

Methods

This study was a research and development (R&D) study conducted in the labor room and the accident and emergency unit of Namon Hospital from January 2024 to November 2025. It was divided into three phases, as shown in Figure 1: Phase 1, situation and problem analysis (January–March 2024); Phase 2, model development using two PDCA cycles (April–September 2024); and Phase 3, implementation and evaluation (October 2024–November 2025). Nurse outcomes were evaluated using a one-group pretest–posttest design, while maternal outcomes were compared with a historical control group from medical records.

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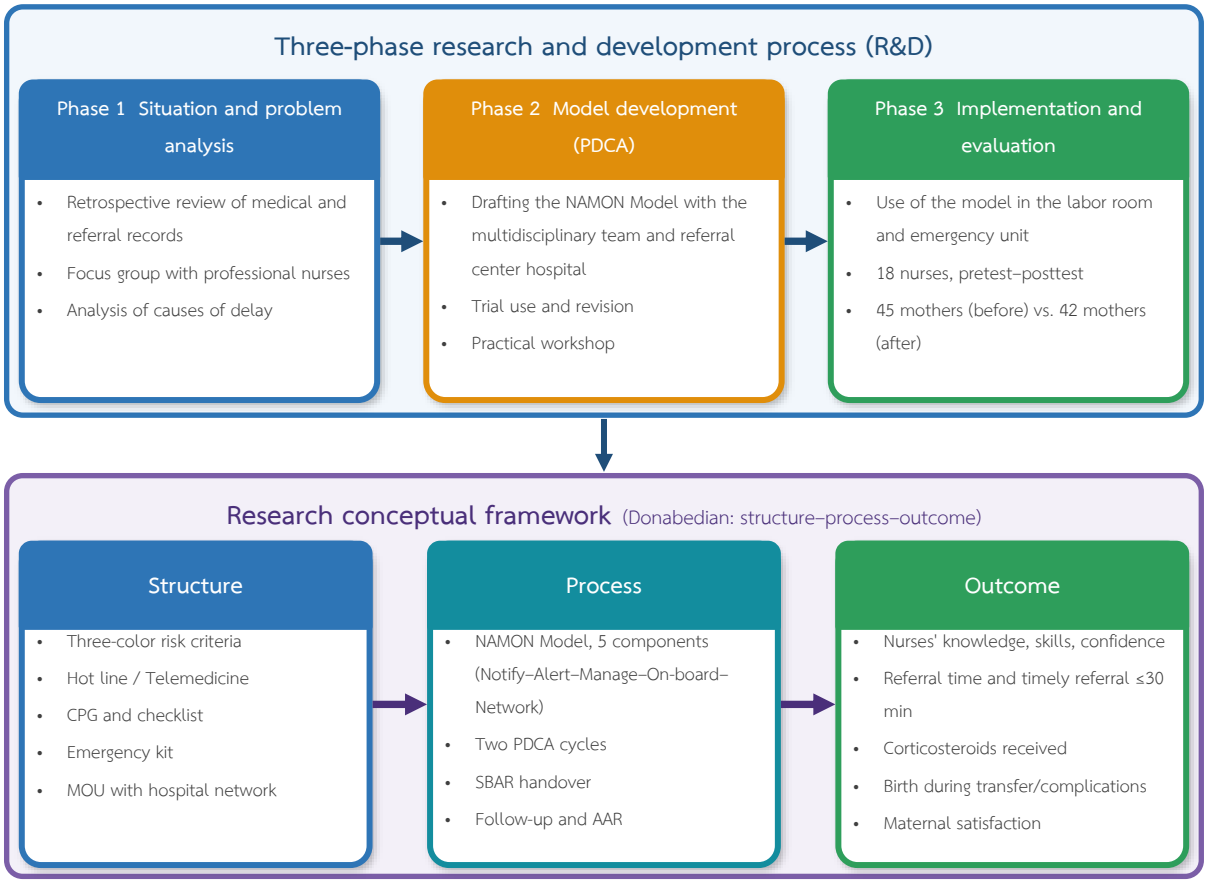


Figure 1 Three-phase research and development process and research conceptual framework

Population

The population comprised 1) professional nurses in the labor room and the accident and emergency unit of Namon Hospital, and 2) mothers with preterm labor (gestational age 28 to <37 weeks) who were referred to the referral center hospital.

Sample

All eligible members of the population were included (no sample size calculation was performed), comprising 1) 18 professional nurses; 2) 45 mothers in the pre-implementation group, from retrospective medical records (January–December 2023); and 3) 42 mothers in the post-implementation group (October 2024 – September 2025). (A total of 49 and 45 mothers were referred, respectively; 4 and 3 were excluded because of critical condition or incomplete data, respectively.) This sample size has a statistical power of more than 0.99 for the primary outcome but is insufficient for rare outcomes.

Inclusion Criteria

Professional nurses who had worked for at least 6 months and were willing to participate; mothers diagnosed with preterm labor at a gestational age of 28 to <37 weeks who were referred and could communicate in Thai (the post-implementation group signed informed consent; the pre-implementation group was exempted from consent because retrospective data were used).

Exclusion Criteria

Mothers in critical condition requiring resuscitation before referral, or with incomplete medical record data. Withdrawal criteria: nurses who transferred, took study leave, or withdrew during the study.

Research Instruments

The instruments comprised 1) intervention tools, namely the NAMON Model; a three-color risk stratification tool (green, yellow, red) (red: gestational age <34 weeks, cervical dilatation ≥4 cm, or complications; yellow: gestational age 34–36+6 weeks, or cervical dilatation 1–3 cm with regular uterine contractions; green: uterine contractions without cervical change); a clinical practice guideline (CPG) with a checklist; and a pocket handbook; and 2) data collection tools, namely a 20-item knowledge test (1 point per correct answer); a skill assessment form for risk assessment and referral decision-making (full score 40), rated by an assessor who was not the trainer using simulated scenarios; a confidence and readiness questionnaire (5-point rating scale); a referral time and outcome record form; a maternal satisfaction questionnaire; and a model appropriateness evaluation form for experts. Knowledge and skills were interpreted using Bloom's criteria (80% or higher = high), and a mean of 4.51–5.00 = highest level. Content validity was examined by three experts, with an Index of Item-Objective Congruence (IOC) of 0.67–1.00. The knowledge test had a KR-20 of 0.82, and the confidence and satisfaction questionnaires had Cronbach's alpha coefficients of 0.87 and 0.89, respectively.

Time Point Definitions

Time from arrival to referral decision was counted from the time of registration in the labor room/emergency room to the time the physician ordered the referral. Time from decision to departure was counted from the time of the referral order to the time the ambulance left the hospital. Timely referral meant departure within 30 minutes after the decision. For the pre-implementation group, times recorded in the medical record and referral form were used; for the post-implementation group, the newly developed time record form was used.

Data Collection

Phase 1: retrospective review of medical records and referral records, and a focus group discussion with professional nurses to analyze the causes of delay. Phase 2: drafting the model together with the multidisciplinary team and the referral center hospital, trial use, revision through PDCA cycles, and a practical workshop. Phase 3: collecting data on nurses' knowledge, skills, and confidence before training (September 2024) and after use of the model (November 2025), recording referral times for every case, following up neonatal outcomes from the referral center hospital, and assessing maternal satisfaction after referral.

Data Analysis

Frequencies, percentages, means, and standard deviations were used. Nurses' scores before and after implementation were compared using the paired t-test (distribution of the differences was checked with the Shapiro-Wilk

test). Referral times between groups were compared using the independent t-test without assuming equal variances (Welch's t-test), and categorical outcomes were compared using the chi-square test (Yates' correction) or Fisher's exact test when expected counts were less than 5. Risk ratios (RR) and Cohen's d effect sizes were reported. The level of statistical significance was set at .05.

Research Ethics

This study took into account the principles of ethics in human research, including exemption from consent for retrospective medical record data. The researcher explained the objectives, procedures, and benefits of the study, and participants signed informed consent voluntarily. Data were kept confidential and presented in aggregate. Participants could withdraw at any time without any effect on their work or on the services they received.

Results

1. Situation and problems of referring mothers with preterm labor

The 18 professional nurses were all female, with a mean age of 34.56±7.82 years and mean experience of 10.22±6.45 years. Most had never been trained in the care of mothers with preterm labor during transfer (66.67%). From the medical record review and focus group discussions, the mean time from decision to departure was 52.42±12.68 minutes, only 20.00% of referrals were timely (within 30 minutes), and 6.67% of mothers gave birth during transfer. The main causes of delay were 1) no clear risk assessment criteria, so nurses hesitated and feared being blamed for referring too early; 2) multi-step coordination, with waiting for the physician and for acceptance from the referral center hospital; 3) unsystematic preparation of patients and equipment; 4) some nurses lacking skills for care during transfer; and 5) no system for follow-up after referral.

2. Referral model for mothers with preterm labor that was developed

2.1 Components of the model The NAMON Model was drafted, tried out, and revised over two cycles; in cycle 2, the three-color risk criteria were simplified, a hot line and backup radio were added, a ready-made emergency kit was prepared, and handover using SBAR was added. It consists of five components, as shown in Table 1 and Figure 2.

Table 1 Components of the NAMON Model

Component	Activities/content	Tools	Target time	Scientific rationale
N: Notify	Three-color risk assessment based on gestational age, cervical dilatation, contraction frequency, and complications	Three-color risk assessment form	≤5 minutes	Risk management and delay in decision-making[10]

Component	Activities/content	Tools	Target time	Scientific rationale
A: Alert	Hot line to the referral center hospital labor room, responsible person on each shift, physician consultation via telemedicine	Hot line, LINE group, telemedicine, backup radio	≤10 minutes	Clear communication and continuity of care
M: Manage	CPG covering screening, medication, preparation of the patient and equipment, care during transfer, and handover	CPG, checklist, emergency kit	≤15 minutes	Standardized practice guidelines[14]
O: On-board competency	Training in assessment, tocolytic administration, emergency newborn care, emergency delivery in the ambulance, and a mentoring system	Pocket handbook, simulation manikin, video	6 hours; repeat every 3 months	Staff competency development[12,13]
N: Network	MOU with primary and backup hospitals, post-referral follow-up system, and After Action Review (AAR)	MOU, follow-up form, AAR forum	Reviewed monthly	Structure–process–outcome[11]

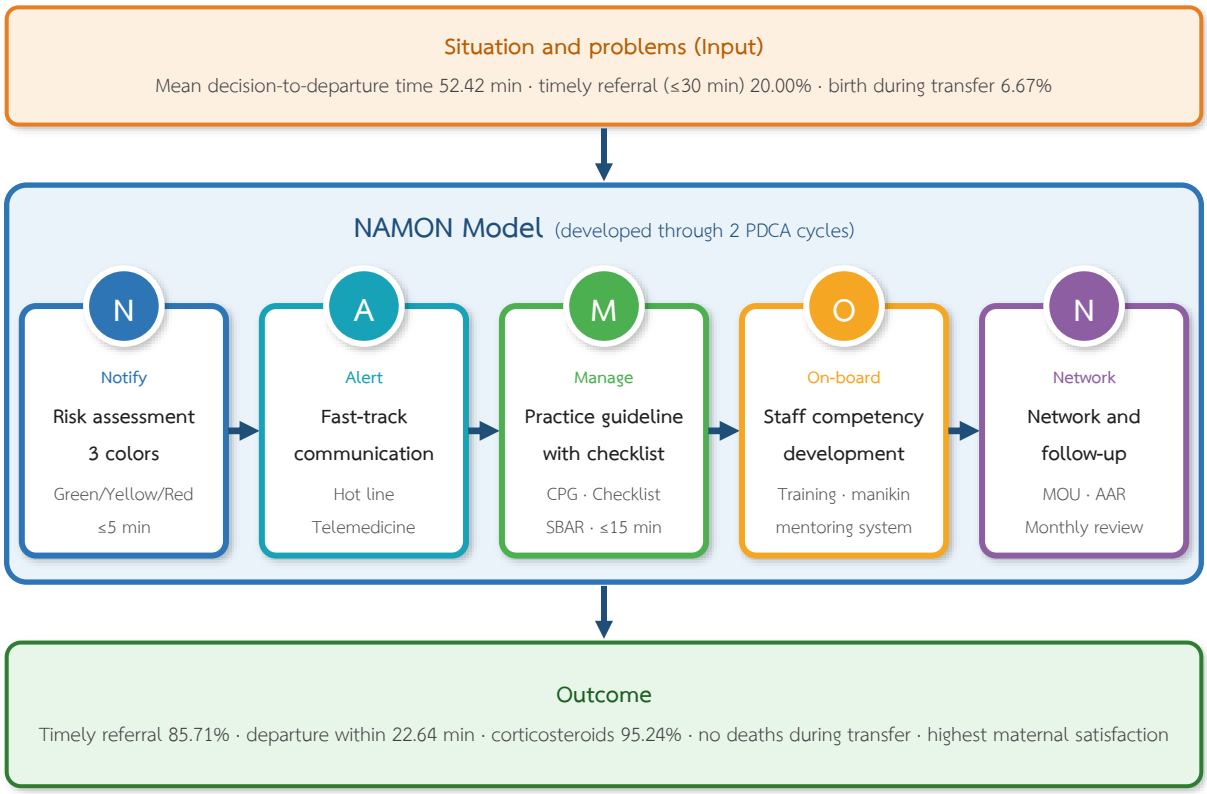


Figure 2 Referral model for mothers with preterm labor (NAMON Model)

2.2 Referral process under the model

When a mother presents with preterm labor symptoms, the nurse performs the three-color risk assessment within 5 minutes. Red-group

mothers are referred immediately, with the hot line notified. While the patient is being prepared and acceptance is awaited, if the gestational age is below 34 weeks, the first dose of corticosteroids and a tocolytic (e.g., nifedipine) are given according to physician orders without delaying departure.[6,7] For the yellow group, with a gestational age of 34–36+6 weeks, these drugs are not given routinely, but the physician considers them case by case, and the mother is then referred within 30 minutes. The green group is observed and reassessed. In every case the checklist is used before departure, and information is handed over using Situation-Background-Assessment-Recommendation (SBAR), as shown in Figure 2. Three experts rated the appropriateness of the model at the highest level ($\bar{x}$ = 4.62, S.D. = 0.38), and nurses used the risk assessment form in every case (42/42 cases, 100%), classified as red in 9 cases (21.43%), yellow in 27 cases (64.29%), and green reassessed and then referred in 6 cases (14.29%).

3. Outcomes of the referral model for mothers with preterm labor

3.1 General characteristics of mothers

Mothers in the pre-implementation group (n = 45) and the post-implementation group (n = 42) had mean ages of 26.84±6.21 and 27.12±5.94 years (t = −0.21, p-value = 0.831) and mean gestational ages of 33.42±2.13 and 33.67±2.05 weeks (t = −0.56, p-value = 0.579), respectively.

3.2 Knowledge, skills, confidence, and readiness of professional nurses After the development, mean scores in all domains were significantly higher than before (t = 9.89–12.16, p-value <0.001, Cohen's dz = 2.33–2.87), and 16 nurses (88.89%) met the criterion of 80% or higher, as shown in Table 2.

Table 2 Comparison of professional nurses' scores before and after model development (n = 18, paired t-test)

Variable	Before $\bar{x}$±S.D.	After $\bar{x}$±S.D.	Level (after)	$\bar{d}$ (95%CI)	t	p-value
Knowledge (full score 20)	12.44±2.31	17.22±1.48	High	4.78 (3.76, 5.80)	9.89	<0.001*
Skills in assessment and referral decision-making (full score 40)	26.50±3.84	35.67±2.40	High	9.17 (7.58, 10.76)	12.16	<0.001*
Confidence in referral decision-making (full score 5)	3.12±0.54	4.38±0.37	High	1.26 (1.02, 1.50)	11.14	<0.001*
Readiness for care during transfer (full score 5)	3.05±0.61	4.42±0.35	High	1.37 (1.10, 1.64)	10.57	<0.001*

*Statistically significant at p-value <.05

3.3 Referral time After the development, the mean time for every step decreased significantly (p-value <0.001); the time from decision to departure decreased from 52.42±12.68 to 22.64±6.15 minutes (Cohen's d = 2.96), as shown in Table 3.

Table 3 Comparison of referral times (minutes) between the pre- and post-implementation groups (Welch's t-test)

Interval	Before (n = 45) $\bar{x}$±S.D.	After (n = 42) $\bar{x}$±S.D.	Difference (95% CI)	t	p-value
Arrival to referral decision	24.80±9.31	12.40±4.62	−12.40 (−15.52, −9.28)	−7.95	<0.001*
Coordination until acceptance	18.53±7.24	6.21±2.38	−12.32 (−14.61, −10.03)	−10.81	<0.001*
Decision to departure	52.42±12.68	22.64±6.15	−29.78 (−34.00, −25.56)	−14.08	<0.001*
Total, arrival to departure[a]	77.22±17.84	35.04±8.73	−42.18 (−48.13, −36.23)	−14.15	<0.001*

*Statistically significant at p-value <.05

[a] Total time = arrival to referral decision + decision to departure

3.4 Referral outcomes After the development, timely referral within 30 minutes increased significantly, and receipt of corticosteroids before referral also increased significantly. Births during transfer and neonatal complications, as defined, decreased but not significantly. No severe complications or deaths occurred during transfer, as shown in Table 4, and mothers in the post-implementation group reported the highest level of satisfaction ($\bar{x}$ = 4.52, S.D. = 0.41).

Table 4 Comparison of referral outcomes between the pre- and post-implementation groups

Outcome	Before (n = 45) n (%)	After (n = 42) n (%)	RR	Statistic	p-value
Timely referral (≤30 minutes)	9 (20.00)	36 (85.71)	4.29	χ^2 = 34.98	<0.001*
Received corticosteroids before referral	28 (62.22)	40 (95.24)	1.53	Fisher	<0.001*
Birth during transfer	3 (6.67)	1 (2.38)	0.36	Fisher	0.617
Neonatal complications	7 (15.56)	2 (4.76)	0.31	Fisher	0.159

*Statistically significant at p-value <.05 χ^2 used Yates' correction

Discussion

The situation analysis found that referral delay arose from structural factors, namely the lack of clear risk assessment criteria and communication channels, and from process factors, namely complex coordination steps and unsystematic patient preparation. This is consistent with Donabedian's framework, which holds that the quality of outcomes depends on the readiness of structure and process,[11] and it reflects the third delay, receiving appropriate care at the referring facility.[10] It is also consistent with a study finding that the lack of clear practice guidelines is a major obstacle to the care of women with preterm labor.[14] Nurses' concern about being blamed for referring too early reflects the need to build a safety culture that emphasizes learning rather than blame.

The model that was developed is appropriate and practical because it was developed from real problems with the

participation of practicing nurses, the multidisciplinary team, and the referral center hospital through PDCA cycles. The three-color risk assessment reduced hesitation in decision-making; the fast-track communication channel reduced coordination steps; the checklist prevented omissions; and handover using SBAR has been found in a systematic review to improve patient safety.[17] This is consistent with studies finding that models with clear steps improve the quality of care for pregnant women with preterm labor,[12,13] and that systematic continuing care reduces adverse outcomes.[15]

After the development, nurses' knowledge, skills, confidence, and readiness increased as a result of the workshop, simulation manikin practice, pocket handbook, and mentoring system, which was associated with the reduced referral time and the increase in timely referral from 20.00% to 85.71%, meeting the 80% target. Mothers received corticosteroids before referral more often, which is an important factor for neonatal outcomes.[6] The model made corticosteroids and tocolytics standard for mothers with a gestational age below 34 weeks, consistent with WHO recommendations,[6,7] while for mothers at 34–36+6 weeks the physician's judgment was used case by case. Although births during transfer and neonatal complications decreased, the decrease was not statistically significant, which may be due to the small number of events.

Limitations of the study: The comparison was made with a pre-implementation group whose data were collected retrospectively from medical records, so the accuracy of time recording differed from that of the post-implementation group, which used a dedicated time record form, and there was no concurrent control group; therefore, causal conclusions cannot be drawn. The study was conducted in a single hospital, the sample size was limited, and mothers in critical condition were excluded; caution is therefore needed when applying the results to other contexts.

Conclusion

The NAMON Model comprises three-color risk assessment, a fast-track communication channel, a practice guideline with a checklist, staff competency development, and a collaborative network with a follow-up system. The model increased nurses' knowledge and skills, reduced referral time, increased timely referral and receipt of corticosteroids before referral, and achieved the highest level of maternal satisfaction. It is therefore an approach that helps reduce delayed referral in the community hospital context.

Recommendations

1. Recommendations for applying the findings: Administrators should designate this model as the standard of practice for the labor room and the accident and emergency unit, review the risk assessment form and practice guideline at least once a year, provide refresher training for new and rotating nurses, and extend the model to community hospitals in the Kalasin Province network.

2. Recommendations for future research: Prospective comparative studies should be

conducted in multiple hospitals, long-term neonatal outcomes such as admission to the neonatal intensive care unit and death should be followed up, the accuracy of the three-color risk assessment tool should be tested, and an information system to support real-time referral tracking should be developed.

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AI Disclosure

The author used an artificial intelligence tool (Claude, Anthropic) to assist in searching for sources and academic references. The author personally verified the accuracy of every reference before use. Data analysis, interpretation of results, and discussion are entirely the author's own work. Artificial intelligence did not participate as a co-author.

References

1. Ohuma EO, Moller AB, Bradley E, Chakwera S, Hussain-Alkhateeb L, Lewin A, et al. National, regional, and global estimates of preterm birth in 2020, with trends from 2010: a systematic analysis. Lancet. 2023;402(10409):1261-71.
2. World Health Organization. Preterm birth [Internet]. Geneva: WHO; 2023 [cited 2025 Nov 1]. Available from: https://www.who.int/news-room/fact-sheets/detail/preterm-birth
3. Ministry of Public Health (TH). Health Data Center (HDC): percentage of Thai women with preterm birth, fiscal years 2021-2023 (in Thai) [Internet]. Nonthaburi: Ministry of Public Health; [cited 2025 Nov 1]. Available from: https://hdcservice.moph.go.th/hdc/reports/
4. Kitjaroenthanarak P. Factors affecting preterm birth among pregnant women at Sisaket Hospital (in Thai). Medical Journal of Srisaket Surin Buriram Hospitals. 2024;39(3):631-40.
5. Waiyanikorn R. Predictive factors of preterm birth among pregnant women at risk of preterm birth in Phetchaburi Province (in Thai). Region 4-5 Medical Journal. 2024;43(3):355-64.
6. World Health Organization. WHO recommendations on antenatal corticosteroids for improving preterm birth outcomes. Geneva: World Health Organization; 2022.
7. World Health Organization. WHO recommendation on tocolytic therapy for improving preterm birth outcomes. Geneva: World Health Organization; 2022.
8. Supathaweewat S. Factors affecting preterm birth, accuracy and coverage of care guidelines for pregnant women with preterm labor, and success rate of tocolysis at Mahasarakham Hospital (in Thai). Mahasarakham Hospital Journal. 2023;20(2):75-88.

9. Hanasa W. Prevalence and risk factors of preterm birth in Bueng Kan Hospital (in Thai). Udonthani Hospital Medical Journal. 2022;30(1):35-44.

10. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. Soc Sci Med. 1994;38(8):1091-110.

11. Donabedian A. Evaluating the quality of medical care. Milbank Mem Fund Q. 1966;44(3 Suppl):166-206.

12. Khianmaen B, Kanmali Y, Tummee W. Development of a nursing care model for pregnant women with preterm labor (in Thai). Journal of Health Systems Research and Development. 2022;15(3):286-300.

13. Haowhan J, Chanthophat P, Mayukhachot K, Saisom B, Sridaoruang C. A nursing care model for pregnant women with preterm labor based on the quality dimensions of intrapartum services (in Thai). Medical Journal of Srisaket Surin Buriram Hospitals. 2021;36(3):503-11.

14. Chaniwaree P, Torsorn B, Sereesathien Y, Winaikij P, Chanthophat P. Development and evaluation of nursing practice guidelines for pregnant women with preterm labor, Samut Sakhon Hospital (in Thai). Journal of Boromarajonani College of Nursing, Suphanburi. 2021;7(2):25-40.

15. Buranasan T, Konkham S. Development of a continuing care model from hospital to home for pregnant women to prevent preterm birth, Nong Han Hospital, Udon Thani Province (in Thai). Journal of Nursing, Health, and Education. 2021;4(3):50-6.

16. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/70/1). New York: United Nations; 2015.

17. Müller M, Jürgens J, Redaèlli M, Klingberg K, Hautz WE, Stock S. Impact of the communication and patient hand-off tool SBAR on patient safety: a systematic review. BMJ Open. 2018;8(8):e022202.

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RESEARCH ARTICLE

Development of an Isolation Patient Management Model in the Inpatient Ward, Namon Hospital, Namon District, Kalasin Province

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Abstract

This research and development study aimed to 1) examine the situation and problems of isolation patient management, 2) develop a management model for patients requiring isolation, and 3) compare outcomes before and after implementation in the inpatient ward of Namon Hospital, Namon District, Kalasin Province. The study was conducted from March 2024 to November 2025 (21 months). Participants were 515 patients admitted to the isolation ward, 56 service recipients who completed the satisfaction questionnaire (purposive sampling), and 30 nursing personnel. Instruments were the developed model, a patient record form, and a 33-item questionnaire. Data were analyzed using descriptive statistics, independent t test, and content analysis.

Most patients were female (75.34%), with a mean age of 43.97 years (SD = 15.04). Major problems were insufficient staffing, shortage of personal protective equipment, and lack of staff confidence. The model comprised three components: 1) supplementary staffing management, 2) integration of resources and referral systems with network partners, and 3) standard care according to the Department of Medical Services guidelines together with staff capacity building. After implementation, 511 patients recovered (99.22%, 95% CI 98.02-99.70) and 4 died (0.78%, 95% CI 0.30-1.98). Mean satisfaction scores before and after implementation were 19.20 and 22.58 out of 30 (difference 3.38, 95% CI 1.25-5.52, $t(110) = 3.14$, $p = .002$). Satisfaction was higher after implementation; however, the absence of a comparison group precludes causal conclusions, and multicenter studies are needed.

Keywords: management model, isolation patients, inpatient ward, cohort ward

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Introduction

Infectious diseases requiring isolation, particularly emerging respiratory infections that spread through droplets and close contact, can cause severe illness in some patients, leading to respiratory failure and death. Hospitals therefore need systems capable of accommodating large numbers of patients requiring isolation within a short time. Patients with respiratory infections requiring isolation, such as influenza and tuberculosis, continue to be admitted to hospitals, and during 2024–2025 Namon Hospital admitted 515 patients requiring isolation to its inpatient ward.

These patients came from Nong Bua, Namon, Song Plueai, Lak Liam, and Yot Kaeng sub-districts. Namon Hospital is a 30-bed community hospital and the only health facility in the district that cares for both infectious and general diseases. The inpatient ward has only 10 registered nurses. When it had to open an additional 12-bed cohort ward and 6 isolation rooms, problems arose: insufficient staffing, a shortage of personal protective equipment, and staff who lacked experience and were anxious about infection. Patients and relatives also lacked confidence in safety and were concerned about crowding in the ward.

The World Health Organization recommends that health facilities plan in advance for outbreaks of respiratory infections, covering patient isolation, cohorting of patients with the same condition, appropriate use of personal protective equipment, and staff education.[1] When patient numbers rise rapidly, facilities need surge capacity in terms of space, personnel, and medical supplies.[2] This applies especially to nurse staffing, as a systematic review found that higher nurse staffing levels were associated with a lower risk of healthcare-associated infections.[3] In addition, isolation may affect the patient experience; isolated patients have been reported to experience greater anxiety and loneliness and to receive fewer visits from staff.[4] A management system for isolation patients should therefore address both patient safety and satisfaction.

The Department of Medical Services, the Department of Disease Control, the Department of Health Service Support, the Infectious Disease Association of Thailand, and the Thai medical schools' hospital network (UHosNet) have issued guidelines for establishing cohort wards, isolation rooms, and field hospitals. Hospitals with suitable buildings are to convert general wards into a cohort ward and single private rooms into isolation rooms by adjusting work systems, airflow and ventilation, bed arrangements, one-way waste disposal, and infection control systems; the guidelines state that additional investment may not be necessary.[5] These must be used together with standard precautions and transmission-based precautions.[6] Nurses play important roles in patient care, infection prevention, and resource management.[7] However, these guidelines are general in nature, and few studies have examined the management of isolation patients in small community hospitals with limited staffing, budgets, and supplies. A search of the ThaiJO and PubMed databases for 2020–2025 using the keywords “management model,” “cohort ward,” “isolation room,” and “community hospital” found that most studies were conducted in large hospitals or field hospitals, or focused only on infection prevention, such as the development of an infection prevention system

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in the cohort ward of Pakham Hospital, Buriram Province.[8]

Establishing a field hospital requires substantial resources, and the facility must be dismantled when it is no longer needed, while establishing a hospitel incurs high costs from venue rental. Managing isolation patients within a hospital's own inpatient ward is therefore a cost-effective and safe option for patients and staff. The researcher therefore developed an isolation patient management model for the inpatient ward of Namon Hospital so that patients receive standard, safe care and are satisfied with the service, staff are confident in their work, and community hospitals in similar contexts can apply it to prepare for emerging infectious diseases.

The conceptual framework of this study used four-phase research and development. The situation and problems of the previous model were used to develop a model with three components based on the guidelines of the Department of Medical Services, and outcomes for patients, staff, and service recipients were then evaluated before and after implementation, following the research and development concept of Borg and Gall[9] and the Department of Medical Services' guidelines for establishing cohort wards, as shown in Figure 1.

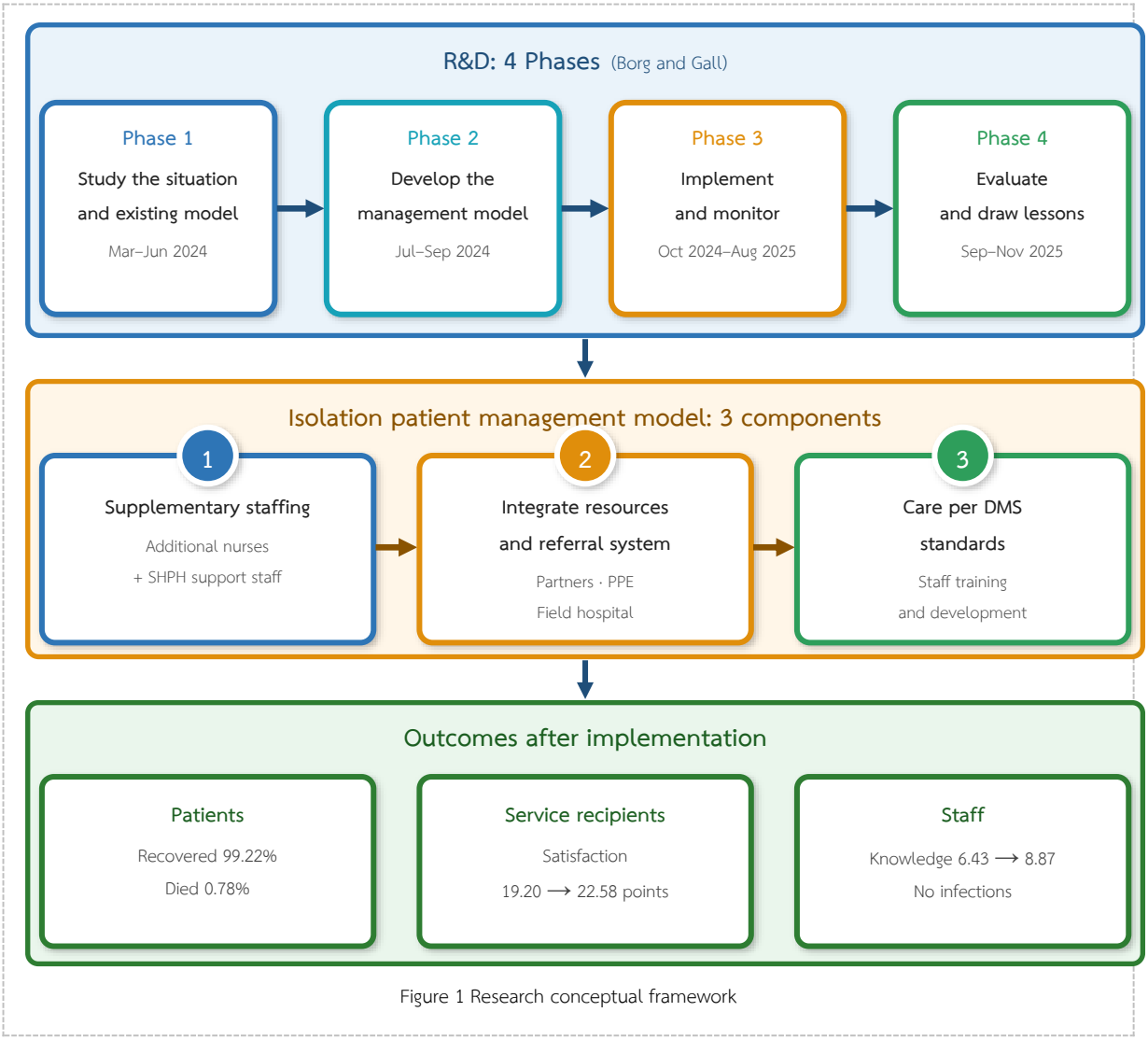


Figure 1 Research conceptual framework

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Research Objectives

1. To examine the situation and problems of isolation patient management in the inpatient ward, Namon Hospital, Namon District, Kalasin Province
2. To develop an isolation patient management model based on objective 1
3. To compare service recipients' satisfaction and staff knowledge and attitudes before and after implementation of the model, and to examine patient outcomes and staff infections after implementation

Methods

This study was research and development (R&D)[9] conducted in the inpatient ward of Namon Hospital, Namon District, Kalasin Province, from March 2024 to November 2025, a total of 21 months. It was divided into four phases: Phase 1, study of the situation and the previous model (March–June 2024); Phase 2, development of the isolation patient management model (July–September 2024); Phase 3, implementation and follow-up, with a process review once a month (October 2024–August 2025); and Phase 4, evaluation, summarization, knowledge exchange, and lessons learned (September–November 2025). Details are as follows:

Phase 1 collected data from medical records, focus groups with 30 staff members, and the service recipient satisfaction questionnaire before development, yielding the problems of the previous model. Phase 2 held workshops with the multidisciplinary team to draft the model, and three experts verified its appropriateness, yielding the draft model. Phase 3 implemented the model and refined it from the monthly review meetings, yielding the final model. Phase 4 evaluated outcomes using the patient record form and questionnaires and drew lessons learned together with the multidisciplinary team.

Population

The population comprised patients with infectious diseases requiring isolation who were admitted to the isolation ward in the inpatient building of Namon Hospital during the study period, totaling 515 patients (from October 2024 to August 2025, the period of model implementation; no pre-implementation clinical outcome data were available for comparison), and 30 staff members working in the isolation ward.

Sample

The sample was divided into three groups: 1) all 515 patients admitted to the isolation ward; 2) 56 service recipients who completed the satisfaction questionnaire, selected by purposive sampling according to the inclusion criteria from patients or relatives who were ready for discharge and willing to complete the questionnaire. The sample size was calculated using G*Power for comparing the means of two independent groups, with an effect size of 0.55, a significance level of .05, and a power of .80, giving 53 per group, increased by 5% to 56 per group. The respondents before and after development were different groups; and 3) 30 nursing personnel and multidisciplinary team members working in the isolation ward, studied as the entire population.

Inclusion Criteria

Patients: 1) diagnosed with an infectious disease requiring isolation and admitted to the isolation ward; 2) able to communicate in Thai; and 3) gave consent to participate in the research. For those under 20 years of age, parental consent was also required. Staff: worked in the isolation ward for at least 1 month and consented to participate in the research.

Exclusion Criteria

Patients who were severely ill and unable to complete the questionnaire, were referred to the parent hospital before the evaluation was completed, or withdrew from the study. No patients were excluded from the analysis of discharge outcomes (n = 515), and no patients were referred to other hospitals during the study period.

Research Instruments

The instruments comprised 1) implementation tools: the developed isolation patient management model, the cohort ward workflow chart, admission guidelines, and guidelines for abnormal symptoms requiring physician notification; and 2) data collection tools: a patient record form and a five-part questionnaire with 33 items in total, consisting of general information (9 items), knowledge of isolation patient management (10 items; yes/no), attitudes (5 items), satisfaction (6 items; 5-point rating scale), and open-ended questions (3 items). Content validity was examined by three experts, giving IOC values between 0.67 and 1.00. Reliability was tested by a trial with 30 people with similar characteristics, giving a KR-20 of 0.78 for the knowledge test and Cronbach's alpha coefficients of 0.82 and 0.86 for the attitude and satisfaction questionnaires, respectively. The knowledge and attitude sections were completed by staff, and the satisfaction section by service recipients, while the general information and open-ended questions were completed by both groups. The researcher developed the questionnaire from the guidelines of the Department of Medical Services and a literature review. The total satisfaction score ranged from 6 to 30, and Cronbach's alpha of the satisfaction scale from the actual sample after development (n = 56) was 0.86.

Data Collection

The researcher explained the objectives and obtained consent from the participants. Patient data were collected from the record form and medical records. Service recipient satisfaction was assessed before development (March 2024) and after development (November 2025), and staff knowledge and attitudes were assessed before and after implementation of the model. Qualitative data were collected from monthly process review meetings and the lessons-learned session. Research assistants who did not provide direct service to the respondents distributed and collected the questionnaires; respondents did not write their names and placed the questionnaires in a sealed box. The process review meetings were attended by the head of the inpatient unit, registered nurses, the infection control (IC) team, and the Surveillance and Rapid Response Team (SRRT), about 10–12 people each time, lasting about 1 hour, and problems, obstacles, and solutions were recorded on a meeting record form.

Data Analysis

Quantitative data were analyzed with SPSS for Windows version 26 using descriptive statistics: frequency, percentage, mean, and standard

deviation. Satisfaction scores before and after development were compared using the independent t test because the respondents before and after were different groups, and the mean difference, 95% CI, and effect size were reported. Staff data (n = 30) before and after were compared using the paired t test or the Wilcoxon signed-rank test. Proportions were reported with 95% CI. Two-tailed tests were used at a significance level of .05. Qualitative data were analyzed by content analysis: the researcher and two co-researchers repeatedly read the data, coded and categorized it, and summarized the themes, and credibility was checked through analyst and data-source triangulation.

Research Ethics

This study took human research ethics into account. The researcher explained the objectives, procedures, benefits, and possible risks to participants, and participants signed consent forms voluntarily. For those under 20 years of age, a parent also signed. Data were kept confidential and presented only in aggregate. Participants could decline to answer questions or withdraw at any time without any effect on their medical care. Retrospective medical record data were exempted from consent by the ethics committee, and patients aged 7–17 years gave assent together with parental consent.

Results

1. Situation and Problems of Isolation Patient Management in the Inpatient Ward

1.1 General information of patients.

Among the 515 patients admitted to the isolation ward, most were female (75.34%) and aged 31–44 years (40.97%), with a mean age of 43.97 years (S.D. = 15.04) and a median of 42 years (IQR 34–54). Most were farmers (63.11%); students/not employed accounted for 5.24% (including all 18 patients under 18 years of age); 63.69% had completed secondary education, and 42.52% used the local Universal Coverage (gold card) scheme. The most common infection risk factors were sleeping together (34.56%), eating together (31.65%), and sharing a toilet (21.75%). The most common symptoms were chest tightness/dyspnea (54.17%), fever (35.34%), and dry cough (29.13%) (multiple responses allowed), as shown in Table 1.

Table 1 General information of patients admitted to the isolation ward (n = 515)

Item	Number	Percent
Sex		
Male	127	24.66
Female	388	75.34
Age		
Under 18 years	18	3.50
18-30 years	68	13.20
31-44 years	211	40.97

Item	Number	Percent
45-59 years	153	29.71
≥ 60 years	65	12.62
$\bar{x}$ ± S.D. = 43.97 ± 15.04 years; Median (IQR) = 42 (34-54) years		
Occupation		
Farmer	325	63.11
Hired laborer	119	23.11
Merchant	30	5.83
Civil servant	14	2.72
Student/not employed	27	5.24
Education level		
Below primary	38	7.38
Primary	86	16.70
Secondary	328	63.69
Diploma	28	5.44
Bachelor's degree	35	6.80
Health coverage		
Gold card (UC), in-area	219	42.52
Gold card (UC), out-of-area	189	36.70
Social security	72	13.98
Civil servant	35	6.80
Infection risk factors (multiple responses)		
Sleeping together	178	34.56
Eating together	163	31.65
Sharing a toilet	112	21.75
Symptoms (multiple responses)		
Chest tightness/dyspnea	279	54.17
Fever	182	35.34
Dry cough	150	29.13

Item	Number	Percent
Muscle pain	98	19.03
Pneumonia	26	5.05
Discharge outcome (outcomes after implementation; see section 3.3)		
Recovered	511	99.22
Disability	0	0.00
Referred to another hospital	0	0.00
Died	4	0.78

1.2 Situation and problems of the previous model. Four major problems were found from a review of medical records, meeting minutes, and focus groups with 30 staff members: 1) Personnel: the inpatient ward had 10 registered nurses caring for 30 beds; when a 12-bed cohort ward and 6 isolation rooms were opened, staffing was insufficient, and staff lacked experience in caring for infected patients and experienced anxiety and stress. 2) Budget and supplies: the reimbursable budget covered only treatment costs by entitlement, procurement of equipment was restricted by government regulations, and personal protective equipment was in short supply. 3) Service system: the number of patients requiring isolation increased continuously, causing crowding in the ward. 4) Service recipients: patients and relatives lacked confidence in the safety of receiving services.

2. Isolation Patient Management Model in the Inpatient Ward

2.1 Model components. The developed model comprised three components: 1) staffing management, by increasing the number of nurses on duty in the isolation ward; 2) integration of budget, resources, and the referral system with network partners; and 3) patient care according to the standards of the Department of Medical Services together with training to build staff capacity, as shown in Table 2. All three components were derived from the problems identified in Phase 1 together with the guidelines of the Department of Medical Services. The head of the inpatient unit was primarily responsible, together with the IC team and the clinical lead team, and the model was verified for appropriateness by three experts.

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Table 2 Comparison of the previous model and the developed isolation patient management model, inpatient ward, Namon Hospital

Previous model	Developed model	Rationale and supporting evidence (references 2, 3, 5-7)
Used the regular staffing of the inpatient department, resulting in a heavy workload	Increased the number of nurses on duty in the isolation ward to at least 3 on the morning shift (2 registered nurses and 1 supplementary staff member from a sub-district health promoting hospital, SHPH)	Requesting supplementary staff from other units and SHPHs, together with rotating shift schedules, increased personnel numbers and enabled timely care for a large number of patients
Relied on the treatment budget by entitlement; equipment could not be supplied in sufficient quantity for the increasing number of patients	Integrated budget and supplies from network partners, such as masks and PPE sets donated by the community and the district office, and established referral channels for critically ill patients to the parent hospital and Kalasin Hospital	The reimbursable budget covered only treatment costs, and procurement of equipment or structural modification was restricted by government regulations; support from network partners and the private sector reduced delays
Provided care as part of routine duties	Cared for patients according to the standards of the Department of Medical Services and trained staff in additional measures, such as chest X-ray (CXR) on days 1 and 5 with a mobile X-ray unit, blood collection by laboratory staff for every patient, and transport home	Consistent adherence to the updated guidelines gave nurses confidence, enabled good collaboration with the multidisciplinary team, and gave patients trust in the service

2.2 Hospital-specific practices and innovations. These included: arranging the ward layout with separate entrances for staff and patients, a buffer zone, and a PPE changing room; using telemedicine for communication between physicians and patients; chest radiography with a mobile X-ray unit on days 1 and 5; having laboratory staff collect blood samples (complete blood count: CBC, blood urea nitrogen: BUN, creatinine: Cr, electrolytes, liver function test: LFT) for every patient; setting criteria for abnormal symptoms to be reported to the physician, such as SpO_2 < 96%, temperature > 38.5 °C, or an SpO_2 drop of 3% or more after exertion, according to the

clinical practice guidelines of the Department of Medical Services in use at that time; providing transport for patients to return home at discharge together with advice on self-care at home; and defining roles with the multidisciplinary team, namely the IC team, the SRRT, the laboratory, the inpatient unit, and the outpatient unit.

3. Results of Developing the Isolation Patient Management Model

3.1 Item-level satisfaction. After development, service recipients rated every item at the high level ($\bar{x}$ = 3.70-3.84; interpretation criteria: 4.21-5.00 = highest, 3.41-4.20 = high, 2.61-3.40 = moderate, 1.81-2.60 = low, 1.00-1.80 = lowest). The highest-rated item was infection prevention ($\bar{x}$ = 3.84, S.D. = 1.16), followed by safety of service and non-crowding in the inpatient ward ($\bar{x}$ = 3.79). For adequacy of staff, 8 respondents (14.29%) gave the lowest rating, as shown in Table 3.

Table 3 Item-level satisfaction of service recipients after development of the isolation patient management model (n = 56)

Item	Highest	High	Moderate	Low	Lowest	$\bar{x}$ ± S.D.
1. Infection prevention	21 (37.50)	15 (26.79)	12 (21.43)	6 (10.71)	2 (3.57)	3.84 ± 1.16
2. Safety of service	20 (35.71)	16 (28.57)	10 (17.86)	8 (14.29)	2 (3.57)	3.79 ± 1.19
3. Courtesy and willingness to serve	19 (33.93)	18 (32.14)	9 (16.07)	6 (10.71)	4 (7.14)	3.75 ± 1.24
4. Knowledge and competence of service providers	18 (32.14)	19 (33.93)	8 (14.29)	6 (10.71)	5 (8.93)	3.70 ± 1.28
5. Non-crowding in the inpatient ward	17 (30.36)	22 (39.29)	9 (16.07)	4 (7.14)	4 (7.14)	3.79 ± 1.17
6. Adequacy of staff	18 (32.14)	21 (37.50)	8 (14.29)	1 (1.79)	8 (14.29)	3.71 ± 1.33
Overall (mean of 6 items)						**3.76 ± 0.94**

3.2 Comparison of satisfaction before and after development. The mean satisfaction score before development was 19.20±5.74 and after development was 22.58±5.66 (score range 6-30), an increase of 3.38 points (95% CI 1.25-5.52; t(110) = 3.14, p = .002; Cohen's d = 0.59), as shown in Table 4.

Table 4 Comparison of mean satisfaction scores of service recipients before and after development of the model (Independent t-test)

Period	n	$\bar{x}$ ± S.D.	Difference (95% CI)	t (df)	p
Before development	56	19.20 ± 5.74	3.38 (1.25-5.52)	t(110) = 3.14	.002
After development	56	22.58 ± 5.66			

3.3 Patient and staff outcomes. Of the patients, 511 (99.22%; 95% CI 98.02-99.70) recovered without disability, and 4 (0.78%; 95% CI 0.30-1.98) died. No patients were referred to other hospitals (0 patients). (Recovered means improved and discharged home after completing the isolation period without complications or disability; no pre-implementation data were available for comparison.) No staff infections from work were found (0 of 30; 95% CI 0-11.57%) (surveillance was by daily symptom screening of staff and testing when symptomatic or at high risk). Mean staff knowledge scores increased from 6.43±1.52 to 8.87±0.94 (maximum 10; difference 2.44 points) (paired t test: t(29) = 10.06, 95% CI of the difference 1.94-2.94, p < .001), and attitudes toward isolation patient management were at a good level ($\bar{x}$ = 4.12, S.D. = 0.56, 95% CI 3.91-4.33) (interpretation criteria: 3.41-4.20 = good), higher than before implementation ($\bar{x}$ = 3.65, S.D. = 0.62). Qualitative data from the process review meetings indicated that training and clear guidelines were associated with staff confidence in their work (30 informants; the main themes were clarity of guidelines, supplementary staff, and adequacy of personal protective equipment). Patients and relatives were confident in receiving services.

Discussion

The situation analysis found that the main problems stemmed from the limitations of a small community hospital in terms of staffing, budget, and supplies while the number of patients rose rapidly. The most common symptoms were chest tightness/dyspnea (54.17%) and fever (35.34%), and 5.05% of patients had pneumonia (severity was classified according to the clinical practice guidelines of the Department of Medical Services into green, yellow, and red groups, where the red group meets the criteria for referral to the parent hospital, but no patients were referred in this study). The patients could therefore be cared for in the cohort ward of a community hospital according to the prescribed guidelines.[5]

The developed model emphasized the cost-effective use of existing resources by converting an existing ward into a cohort ward and isolation rooms according to the guidelines of the Department of Medical Services and UHosNet,[5] which is likely to cost less than establishing a field hospital or a hospitel; however, this study did not directly analyze costs, so this is only an assumption. Supplementing staffing from other units and SHPHs and integrating resources from network partners helped address the limitations of procurement

regulations, while the use of mobile X-ray and telemedicine helped reduce contact and the risk of transmission, consistent with the principles of preventing droplet and contact transmission[6] and the role of nurses in managing outbreaks.[7] These findings are consistent with the development of an infection prevention system in the cohort ward of Pakham Hospital, Buriram Province,[8] which organized the system from screening at the outpatient building and care in the cohort ward through to discharge planning and continuing care.

The supplementary staffing, which is one component of the model, is consistent with a systematic review that found that adequate nurse staffing levels were associated with a lower risk of healthcare-associated infections,[3] and with the principle of increasing surge capacity, which requires advance planning of space, personnel, and medical supplies.[2] However, this study did not assess healthcare-associated infections in patients, so it cannot be concluded that supplementary staffing reduced infections. The findings are merely consistent with principles and evidence from other studies.

Regarding satisfaction, service recipients gave the highest score to infection prevention ($\bar{x}$ = 3.84), but for adequacy of staff, 8 respondents (14.29%) gave the lowest rating, indicating that staffing remains an issue to be improved. It has also been reported that isolated patients may experience greater anxiety and loneliness and receive fewer visits or follow-up from staff.[4] Regular communication with patients, such as through telemedicine, may help reduce these problems, but further studies are needed to confirm this.

After implementation of the model, almost all patients recovered, and service recipients' satisfaction scores after development were higher than before development. This may be related to training and clear guidelines that gave staff confidence, but it cannot be concluded that this was an effect of the model because there was no comparison group, respondents before and after were different groups, and the disease situation changed over the period. The limitations of this study were: a single hospital; satisfaction assessed in a small sample; no comparison group; respondents before and after being different groups; possible rater bias because the raters were also the service providers; a satisfaction scale of only 6 items; no cost data; and no pre-implementation data for clinical outcomes. Caution should therefore be exercised when applying the results to other contexts.

Conclusion

The isolation patient management model for the inpatient ward of Namon Hospital comprises three components: supplementary staffing management, integration of resources and the referral system with network partners, and standard care together with staff capacity building. After implementation, 99.22% of patients recovered, and service recipients' satisfaction scores after development were statistically significantly higher than before development ($p = .002$). However, because this study had no comparison group, causal conclusions cannot be drawn, and the appropriateness and feasibility of the model have not yet been directly evaluated.

Recommendations

1. Recommendations for applying the research findings

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1.1 Community hospitals in similar contexts may adapt the model to prepare for respiratory infections requiring isolation, after testing its suitability in their own context. They should have at least 10 registered nurses and a network of sub-district health promoting hospitals (SHPHs) that can provide supplementary staff, sources of personal protective equipment support from network partners, and buildings that can separate staff and patient entrances and provide a buffer zone.

1.2 Staff should receive continuous training in infection prevention and control, and plans for supplementary staffing and a resource-support network should be prepared in advance.

1.3 Guidelines should be established for regular communication with, and follow-up visits to, isolated patients in order to reduce their anxiety and loneliness.[4]

1.4 Staffing plans and preparedness for a rapid increase in patient numbers (surge capacity) should be reviewed periodically.[2]

2. Recommendations for future research

2.1 Studies should use a comparison group or be conducted in multiple hospitals.

2.2 Staff outcomes such as infection rates and work-related stress should be followed up, and the cost-effectiveness of the model should be studied.

2.3 Healthcare-associated infections in patients and their relationship with nurse staffing levels should be evaluated.[3]

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AI Disclosure

The author used an artificial intelligence tool (Claude, Anthropic) to assist in searching for sources and academic references. The author personally verified the accuracy of every reference before using it. Data analysis, interpretation of results, and the discussion are entirely the author's own work. Artificial intelligence did not participate as a co-author.

References

1. World Health Organization. Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care. Geneva: World Health Organization; 2014.
2. Hick JL, Hanfling D, Burstein JL, DeAtley C, Barbisch D, Bogdan GM, et al. Health care facility and community strategies for patient care surge capacity. Ann Emerg Med. 2004;44(3):253-61.

3. Mitchell BG, Gardner A, Stone PW, Hall L, Pogorzelska-Maziarz M. Hospital staffing and health care-associated infections: a systematic review of the literature. Jt Comm J Qual Patient Saf. 2018;44(10):613-22.
4. Abad C, Fearday A, Safdar N. Adverse effects of isolation in hospitalised patients: a systematic review. J Hosp Infect. 2010;76(2):97-102.
5. Department of Medical Services, Department of Disease Control, Department of Health Service Support, Infectious Disease Association of Thailand, UHosNet. Guidelines for establishing cohort wards, isolation rooms and field hospitals [Internet]. Nonthaburi: Department of Medical Services; 2563 [cited 2024 Mar 1]. Available from: https://covid19.dms.go.th (in Thai)
6. Siegel JD, Rhinehart E, Jackson M, Chiarello L, Healthcare Infection Control Practices Advisory Committee. 2007 Guideline for isolation precautions: preventing transmission of infectious agents in health care settings. Am J Infect Control. 2007;35(10 Suppl 2):S65-164.
7. Photharin W, Chaisit Y, Chanbunwat K, Phaibunrungrot P, Imnamkhao S. Epidemic situation of coronavirus disease 2019: the role of nurses. J Health Sci Boromarajonani Coll Nurs Sapphasitthiprasong. 2020;4(2):1-19. (in Thai)
8. Yuankul S. Development of an infection prevention system in the COVID-19 cohort ward during the COVID-19 pandemic, Pakham Hospital, Buriram Province. Mahasarakham Hospital Journal. 2จ/ภ;21(1):175-87. (in Thai)
9. Borg WR, Gall MD. Educational research: an introduction. 5th ed. New York: Longman; 1989.

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RESEARCH ARTICLE

Development of a Participatory Patient Care Model Using Homeopathic Medicine at Kalasin Hospital

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Abstract

This research and development study aimed to 1) explore the situation and needs for homeopathic patient care, 2) develop a participatory patient care model using homeopathic medicine, and 3) evaluate the model. The study was conducted at Kalasin Hospital from March 2024 to October 2025. The samples comprised 40 healthcare personnel and 60 patients with chronic or complex conditions, divided into experimental and control groups of 30 each, selected by purposive sampling. Instruments were the care model, a knowledge test, the Measure Yourself Medical Outcome Profile (MYMOP), the EQ visual analogue scale (EQ-VAS), and a satisfaction questionnaire. Data were analyzed using descriptive statistics, paired t test, independent t test, and chi-square test.

The model consisted of five components: personnel capacity building, screening and referral, holistic case-taking with individualized prescribing, patient and family participation, and follow-up evaluation. Personnel knowledge scores increased from 11.25 to 17.45 (difference 6.20, 95% CI 5.27-7.13, $p < .001$), and 35 personnel (87.50%) met the 80% criterion. After 12 weeks, the experimental group had lower MYMOP scores (difference -1.48, 95% CI -1.88 to -1.08, $p < .001$) and higher EQ-VAS scores (difference 13.36, 95% CI 8.40-18.32, $p < .001$) than the control group. Transient aggravation occurred in 3 patients (10.00%); no serious adverse events were found. Satisfaction was at the highest level ($\bar{x}$ = 4.52, S.D. = 0.48). The model was associated with better symptom and quality-of-life scores than usual care, but this was a non-randomized, unblinded quasi-experiment; it should be used alongside conventional treatment and confirmed by randomized controlled trials.

Keywords: homeopathy, participatory care, care model

Introduction

Worldwide, the burden of chronic noncommunicable diseases continues to rise; these diseases cause approximately 41 million deaths per year, or 74% of all deaths globally.[1] Together with antibiotic resistance and patients with multiple comorbidities, conventional medicine alone cannot fully meet patients' needs. The World Health Organization therefore encourages the integration of safe traditional and complementary medicine into health service systems.[2,3] Homeopathy, devised by the German physician Samuel Hahnemann in 1796 (more than 200 years ago), is a complementary medical system widely used in many countries. It rests on three principles: the law of similars, the law of minimum dose, and the law of single remedy.[4] It aims to care for patients holistically, addressing the body, emotions, mind, and behavior.

In Thailand, homeopathy has not been officially recognized by the Ministry of Public Health. Although the Homoeopathic Association of Thailand was established on June 1, 2010, and health personnel have been trained to the standards of the European homeopathic association in cooperation with the Rangsit Wichachalai Institute, Rangsit University, service provision in public hospitals remains limited. Homeopathic medicines have not been approved by the Food and Drug Administration, and trained practitioners may provide services only within the scope of their existing professional licenses. According to the Homoeopathic Association of Thailand, only two government agencies provide the service: the Golden Jubilee Medical Center, Mahidol University, and the Bureau of Alternative Medicine, Ministry of Public Health.[5] Meanwhile, most health personnel have very little knowledge of this discipline. Kalasin Hospital is a provincial general hospital where approximately 21,598 patients with chronic diseases receive services per year. Among them are patients with complex or chronic conditions that respond incompletely to conventional treatment, such as allergies, chronic skin rashes, insomnia, anxiety, chronic muscle pain, and chronic oral ulcers, estimated at about 12%[6] (approximately 2,592 patients per year, estimated from chronic disease patient data in the annual report). However, there is no systematic care model that uses homeopathy as complementary medicine.

Empirical evidence on homeopathy remains varied. A systematic review and meta-analysis of individualized homeopathic treatment found a possible small advantage over placebo, but the quality of the evidence was low.[7] A 2023 systematic review of meta-analyses found that most meta-analyses showed superiority over placebo; however, the authors are affiliated with homeopathy and the findings remain debated.[8] Meanwhile, a report by Australia's National Health and Medical Research Council stated that there is no reliable evidence of effectiveness for any specific health condition.[9] Nevertheless, a cohort study in routine clinical practice found continuing improvement in symptoms and quality of life among patients with chronic diseases,[10] and a systematic review found that most adverse events were mild and self-limiting.[11] In addition, the chronic care model[12] and patient-centered care[13] emphasize the participation of

patients, families, and the multidisciplinary team, which is consistent with the holistic case-taking and the constructive therapeutic relationship between patient and practitioner in homeopathy. However, no study has yet developed a participatory care model using homeopathy in the context of a public hospital in Thailand.

The authors were therefore interested in developing a participatory patient care model using homeopathy at Kalasin Hospital by disseminating knowledge to health personnel involved in the care of patients with chronic or complex conditions and by involving patients and families in the treatment process, in order to add a care option alongside conventional medicine and to monitor safety systematically. The results are expected to serve as a prototype for integrative medicine services in provincial hospitals and as baseline information for developing service standards and research on homeopathy in Thailand.

Research Objectives

1. To explore the situation and needs regarding patient care using homeopathy at Kalasin Hospital
2. To develop a participatory patient care model using homeopathy at Kalasin Hospital
3. To evaluate the effects of the participatory patient care model using homeopathy on personnel knowledge and on patients' symptoms, quality of life, and satisfaction

Methods

This study was research and development (R&D) that applied participatory action research following the PAOR cycle: plan, act, observe, and reflect.[14] It was conducted at Kalasin Hospital, Kalasin Province, from March 2024 to October 2025 and was divided into three phases: Phase 1, situation and needs analysis (March–June 2024); Phase 2, model development (July–December 2024); and Phase 3, implementation and evaluation of the model using a quasi-experimental, two-group, pretest–posttest design without randomization or blinding (January–October 2025). The program lasted 12 weeks. Details are as follows. The researcher assigned patients to groups by matching on sex, age, and symptom group, and collected the outcome data, in which patients rated their own symptoms and quality of life (patient-reported outcomes).

Population

The population comprised two groups: 1) health personnel involved in the care of patients with chronic diseases at Kalasin Hospital, namely physicians, dentists, pharmacists, professional nurses, and Thai traditional medicine practitioners; and 2) patients with chronic diseases or complex conditions who received services at Kalasin Hospital during January–September 2025, numbering approximately 1,944 (estimated as 12% of the 21,598 chronic disease patients per year, over 9 months).

Sample

1) Phases 1–2: key informants were 15 health personnel, 10 patients and relatives, and

5 experts who validated the model, selected by purposive sampling. 2) Phase 3: 40 health personnel who participated in capacity building and 60 patients. The sample size was calculated with G*Power[15] for an independent t-test, with an effect size of 0.80, a significance level of .05, and power of .80, giving 26 per group; adding 15% to allow for attrition gave 30 per group (26 × 1.15 = 29.90). The effect size was based on a cohort study in routine clinical practice,[10] a two-tailed test was used, and the MYMOP score was the primary outcome. Participants were selected purposively according to the criteria: of 72 patients screened, 8 did not meet the criteria and 4 declined to participate. Patients were matched (matching) on sex, age, and symptom group and allocated to the experimental group, which received care according to the developed model together with usual care, or the control group, which received usual care.

Inclusion Criteria

1) Aged 18 years or older; 2) diagnosed with a chronic disease or having complex chronic symptoms continuously for at least 3 months and receiving stable conventional treatment (no change in the type or dose of major medication for at least 3 months before enrollment); 3) able to communicate well in Thai; 4) able to attend follow-up throughout the program; and 5) willing to participate and sign informed consent. For personnel: having worked at Kalasin Hospital for at least 1 year and being willing to complete all planned activities.

Exclusion Criteria

1) Emergency illness or severe complications requiring urgent conventional treatment; 2) pregnancy or undergoing chemotherapy or radiotherapy for cancer; 3) cognitive or psychiatric impairment that prevented providing information; and 4) withdrawal or missing follow-up two consecutive times.

Research Instruments

The instruments comprised 1) intervention tools: the participatory patient care model using homeopathy, a holistic case-taking manual, and a personnel capacity-building curriculum; and 2) data collection tools: (1) a general information questionnaire; (2) a 20-item knowledge test on homeopathy; (3) the Measure Yourself Medical Outcome Profile (MYMOP) for symptom assessment, scored 0 – 6, where lower scores indicate better symptoms;[16] (4) the EQ visual analogue scale (EQ-VAS) for quality of life, scored 0–100;[17] (5) a 15-item satisfaction questionnaire on a 5-point rating scale; (6) an adverse event record form; and (7) focus group and in-depth interview guides. Content validity was checked by three experts, giving an IOC of 0.67–1.00. The instruments were piloted with 30 people with similar characteristics; the knowledge test had a KR-20 of 0.82 and the satisfaction questionnaire had a Cronbach's alpha coefficient of 0.89.

Data Collection

The researcher and trained research assistants collected qualitative data through focus groups and in-depth interviews in Phases 1–

2. In Phase 3, personnel knowledge was tested before and after capacity building, and patients were assessed with the MYMOP and EQ-VAS at week 0 (baseline) and week 12 (post-intervention). Symptoms and adverse events were followed up at weeks 4 and 8 (experimental group only; the control group was assessed only at weeks 0 and 12, and data collectors were not blinded to group allocation). Satisfaction was assessed at the end of the program.

Data Analysis

Qualitative data were analyzed by content analysis. Quantitative data were analyzed with descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics: the paired t test for within-group comparisons, the independent t test for between-group comparisons, and the chi-square test for categorical variables. Normality was checked with the Shapiro-Wilk test; if the data were not normally distributed, the Wilcoxon signed-rank test and Mann-Whitney U test were used instead. Analyses were performed with SPSS for Windows version 26. The primary outcome was the MYMOP score at the end of week 12. P values for secondary outcomes were not adjusted for multiple testing, so they were interpreted as exploratory. The level of statistical significance was set at .05.

Research Ethics

This study followed the ethical principles for research involving human participants of Kalasin Hospital, and permission to collect data was obtained before data collection began in March 2024. The researcher explained the objectives, procedures, benefits, and possible risks to participants, and participants gave written informed consent. All patients continued to receive their usual conventional treatment. The researcher informed patients that scientific evidence on the effectiveness of homeopathy is limited and that the medicines used came from manufacturers meeting production standards under the Homoeopathic Pharmacopoeia. Homeopathic medicines were dispensed by trained practitioners. The authors confirm that dispensing homeopathic medicines not registered with the Food and Drug Administration in this study was carried out within Kalasin Hospital, a government agency under the Ministry of Public Health, in its role of providing medical treatment, which is exempt from the prohibition on unregistered drugs under the Drug Act B.E. 2510 (1967), Section 72, last paragraph, and Section 13 (5) in the case of importing or ordering drugs into the Kingdom,[18] in compliance with the criteria, procedures, and conditions specified in the relevant ministerial regulations and announcements. The medicines were used only for patients participating in the research under the prescription of trained practitioners and were not sold to the general public. Data were kept confidential and presented in aggregate form. Participants could withdraw at any time without any effect on their care.

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Results

1. Situation and needs regarding patient care using homeopathy

1.1 General characteristics of the sample Of the 40 health personnel, most were female (75.00%), with a mean age of 38.45 years (S.D. = 8.72); 45.00% were professional nurses, 22.50% physicians and dentists, 17.50% pharmacists, and 15.00% Thai traditional medicine practitioners. Most patients in the experimental and control groups were female (66.67% and 63.33%, respectively), with mean ages of 52.37 years (S.D. = 11.24) and 53.10 years (S.D. = 10.86), respectively. The most common symptom groups were allergies and chronic skin rashes, insomnia and anxiety, chronic muscle pain, and chronic oral ulcers. General characteristics did not differ between the two groups (age $t(58) = -0.26$, $p = .80$, SMD = −0.07; female sex $\chi^2(1) = 0.07$, $p = .79$, SMD = 0.07).

1.2 Situation and needs Focus groups and in-depth interviews identified the following key issues: 1) most personnel had little knowledge of homeopathy, and there were no clear service guidelines; 2) some patients with chronic diseases had to take multiple medications for a long time and wanted safe, holistic treatment options; 3) patients and relatives wanted to participate in decision-making and symptom monitoring; and 4) personnel had concerns about the empirical evidence and the legal status. Thirty-three personnel (82.50%) (from the needs questionnaire completed by all 40 personnel) wanted knowledge and service systems for homeopathy to be developed alongside conventional treatment.

2. Development of the participatory patient care model using homeopathy

2.1 Components of the model Through two PAOR cycles, the "KALASIN HOMEO Model" was developed. It consists of five components: 1) personnel capacity building; 2) patient screening and referral; 3) holistic case-taking and individualized prescribing; 4) patient and family participation; and 5) follow-up evaluation according to the direction of healing. Activities ran throughout the 12-week program, as shown in Table 1 and Figure 1.

Table 1 Activities of the participatory patient care model using homeopathy

Week	Activities/Content	Tools	Duration	Academic Rationale
1	Personnel capacity building: the three principles, materia medica, holistic case-taking, and safety	Training curriculum, manual, knowledge test	2 days (12 hours)	Mastery learning, 80% criterion[19]

Week	Activities/Content	Tools	Duration	Academic Rationale
1	Patient screening and referral; assessment of symptoms and quality of life before the intervention	Screening guideline, MYMOP, EQ-VAS	30 min	Chronic Care Model[12]
1	Holistic case-taking covering body, emotions, mind, and behavior, and individualized homeopathic prescribing (single remedy)	Case-taking record form, repertory, materia medica	60–90 min	Law of similars, minimum dose, and single remedy[4]
2-11	Patient and family participation: shared goal setting, self-recorded symptoms, and a peer learning group	Symptom diary, LINE group	30 min/visit	Patient-centered care[13]
4, 8, 12	Follow-up evaluation according to the direction of healing, medication adjustment, and surveillance for adverse events	MYMOP, adverse event record form	30–45 min	Homeopathic aggravation and safety[11,20]
12	Post-intervention evaluation, lessons learned, and reflection with the multidisciplinary team	MYMOP, EQ-VAS, satisfaction questionnaire, interview guide	3 hours	PAOR cycle[14]

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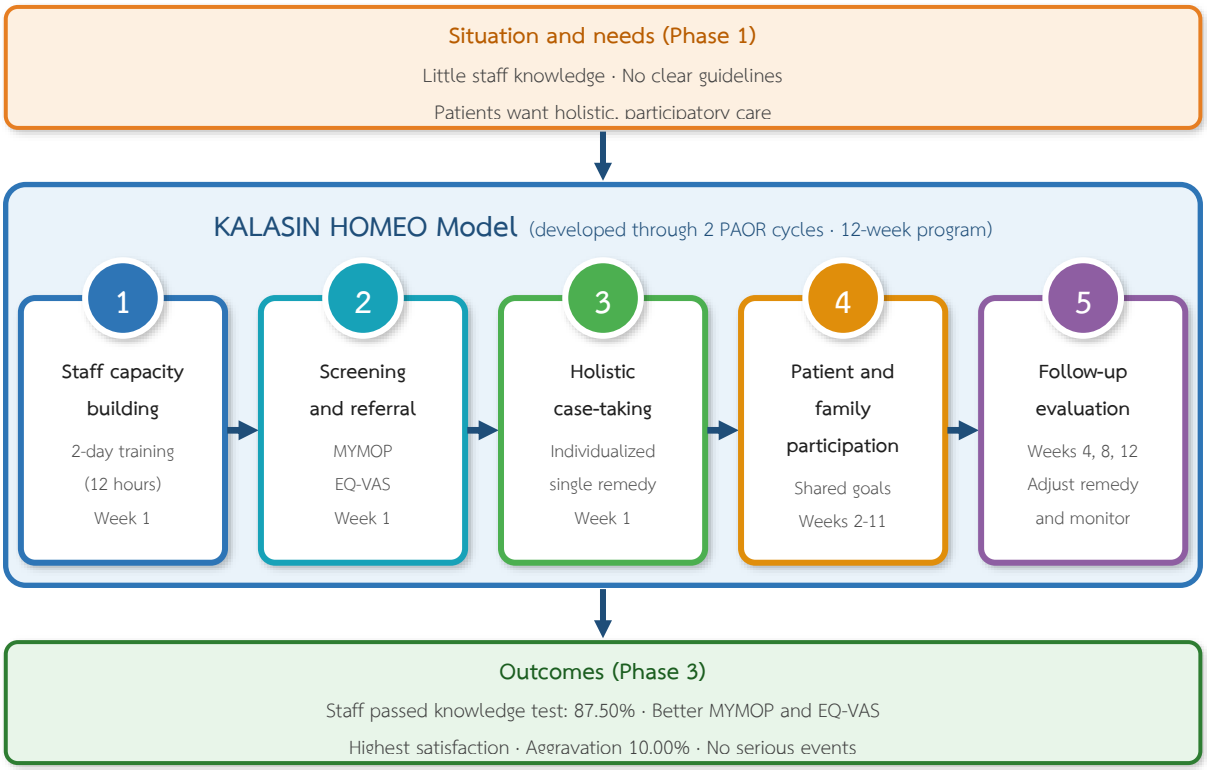


Figure 1 Participatory patient care model using homeopathy (KALASIN HOMEO Model)

2.2 Model validation Five experts rated the appropriateness and feasibility of the model overall at the highest level ($\bar{X}$ = 4.56, S.D. = 0.42). They suggested adding criteria for referring patients back to conventional treatment when symptoms become severe and recording adverse events systematically, which the researcher incorporated in the second cycle.

3. Evaluation of the participatory patient care model using homeopathy

3.1 Within-group comparisons before and after the intervention After capacity building, the mean knowledge score of health personnel (17.45 points, S.D. = 1.68, out of 20) was higher than before (11.25 points, S.D. = 3.10) (mean difference 6.20, 95% CI 5.27–7.13, t(39) = 13.52, p < .001), and 35 personnel (87.50%) met the 80% criterion (95% CI 73.89–94.54, Wilson method), which met the predefined success indicator. For patients, after the intervention the experimental group had lower MYMOP symptom scores and higher EQ-VAS quality-of-life scores (p < .001), whereas the control group showed small changes with confidence intervals that included zero (p = .121–.123), so no change could be concluded, as shown in Table 2.

Table 2 Comparison of mean symptom (MYMOP) and quality-of-life (EQ-VAS) scores before and after the intervention by group (n=**30** per group)

Variable	Group	Before		After		$\bar{d}$	95%CI	t(29)	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.				
MYMOP (0-6)	Exp.	3.85	0.72	2.12	0.81	-1.73	-2.02, -1.44	-12.15	<0.001*

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Variable	Group	Before		After		$\bar{d}$	95%CI	t(29)	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.				
MYMOP (0-6)	Control	3.78	0.69	3.60	0.74	-0.18	-0.41, 0.05	-1.59	0.123
EQ-VAS (0-100)	Exp.	58.40	10.25	74.63	9.12	16.23	12.91, 19.55	9.99	<0.001*
EQ-VAS (0-100)	Control	59.10	9.87	61.27	10.04	2.17	-0.61, 4.95	1.60	0.121

Exp. = experimental group; *Statistically significant, p-value < .05

3.2 Between-group comparisons Before the intervention, mean MYMOP and EQ-VAS scores did not differ between the two groups. After the intervention, the experimental group had lower MYMOP symptom scores than the control group (difference −1.48, 95% CI −1.88 to −1.08, t(58) = −7.39, p < .001) and higher EQ-VAS scores (difference 13.36, 95% CI 8.40–18.32, t(58) = 5.39, p < .001). In terms of change from baseline, the between-group difference was −1.55 for MYMOP (95% CI −1.91 to −1.19) and 14.06 for EQ-VAS (95% CI 9.82–18.30) (the S.D. of the change scores was back-calculated from the confidence intervals of the paired t test), as shown in Table 3.

Table 3 Comparison of mean symptom (MYMOP) and quality-of-life (EQ-VAS) scores between the experimental and control groups

Variable	Experimental group		Control group		$\bar{d}$	95%CI	t(58)	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.				
MYMOP before	3.85	0.72	3.78	0.69	0.07	-0.29, 0.43	0.38	0.702
MYMOP after	2.12	0.81	3.60	0.74	-1.48	-1.88, -1.08	-7.39	<0.001*
EQ-VAS before	58.40	10.25	59.10	9.87	-0.70	-5.90, 4.50	-0.27	0.789
EQ-VAS after	74.63	9.12	61.27	10.04	13.36	8.40, 18.32	5.39	<0.001*
MYMOP change (after – before)	-1.73	0.78	-0.18	0.62	-1.55	-1.91, -1.19	-8.56	<0.001*
EQ-VAS change (after – before)	16.23	8.89	2.17	7.44	14.06	9.82, 18.30	6.64	<0.001*

*Statistically significant, p-value < .05

3.3 Categorical outcomes, satisfaction, and safety The proportion of patients with clinically meaningful symptom improvement (MYMOP decrease of 1 point or more) was 73.33% in the experimental group, higher than the 16.67% in the control group (difference in proportions 56.67 percentage points, 95% CI 35.97–77.36; $\chi^2(1) = 19.46$, p < .001). Patients in the experimental group reported overall satisfaction with the model at the highest level ($\bar{X}$ = 4.52, S.D. = 0.48; 95% CI 4.34–4.70). Transient homeopathic aggravation occurred in 3 patients (10.00%; 95% CI 3.46–25.62) (adverse events were not collected in the control group, so no comparison was possible); these episodes were mild and resolved on their own within 3–7 days. No serious adverse events were found (upper

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bound of the 95% CI = 11.57% if 0 of 30 patients), as shown in Table 4.

Table 4 Comparison of the proportion of patients with clinically meaningful improvement after the intervention between the experimental and control groups

Outcome	Experimental group (%)	Control group (%)	χ^2	p-value
Clinically meaningful improvement (MYMOP decrease ≥ 1 point)	22 (73.33)	5 (16.67)	19.46	<0.001
No change or improvement of less than 1 point	8 (26.67)	25 (83.33)		

Discussion

The situation analysis found that health personnel had little knowledge of homeopathy and that there was no clear service system, consistent with the situation in Thailand, where homeopathy has not been officially recognized and is offered in only a few public hospitals.[5] Patients with chronic diseases wanted safe, holistic treatment options, in line with the World Health Organization's direction of promoting the safe, evidence-based integration of traditional and complementary medicine into health service systems.[2,3]

The model that was developed covers components from personnel capacity building to follow-up evaluation. This resulted from a participatory action research process that allowed the multidisciplinary team, patients, and families to jointly plan, act, and reflect,[14] so that the model fits the hospital context. The components on patient participation and continuous follow-up are consistent with the Chronic Care Model[12] and patient-centered care,[13] while holistic case-taking and individualized prescribing follow the fundamental principles of homeopathy,[4] which promote a constructive relationship between patient and practitioner.

After the model was implemented, personnel knowledge increased and most met the 80% criterion, because the curriculum emphasized mastery learning and hands-on practice.[19] Patients in the experimental group had better symptom and quality-of-life scores than the control group, which is in the same direction as cohort studies in routine clinical practice;[10,21] however, those studies had no control group, so causal effects cannot be confirmed, and the effect size in this study (Cohen's d of approximately 1.39–1.91, calculated from post-intervention means and S.D.s) was larger than that found in the systematic review.[7] No serious adverse events were found among the 30 patients, and the transient aggravation observed was mild and self-limiting, consistent with

previous systematic reviews;[11,20] however, the sample was too small to conclude on safety. Moreover, the improved outcomes may have resulted from several factors combined, namely the long case-taking time, good rapport, patient participation, and the placebo effect, and evidence at the level of systematic reviews cannot yet clearly confirm a specific effect of homeopathic medicines.[7,9]

Limitations of this study include the lack of randomization and blinding; outcome assessment by the researcher; a primary outcome that was patient-reported; a diverse range of conditions; unequal care time for the control group; a relatively small sample; a short follow-up period; and a single study site. Findings should therefore be generalized with caution. No participants were lost to follow-up, so the intention-to-treat analysis is equivalent to the per-protocol analysis.

Conclusion

The participatory patient care model using homeopathy at Kalasin Hospital consists of five components: personnel capacity building, screening and referral, holistic case-taking and individualized prescribing, patient and family participation, and follow-up evaluation. Personnel knowledge scores increased, and 87.50% met the 80% criterion. At the end of 12 weeks, patients in the experimental group had better symptom and quality-of-life scores than those receiving usual care, and their satisfaction was at the highest level. Transient aggravation occurred in 10.00%. The findings are associated with the model as a whole package of care; this study cannot establish a specific effect of homeopathic medicines or conclude on safety.

Recommendations

1. Recommendations for application. The hospital should apply the model as integrative medicine alongside conventional treatment, not as a substitute for primary treatment, with clearly defined screening criteria, criteria for referring patients back to conventional treatment when symptoms become severe, and an adverse event surveillance system. Personnel capacity building should continue, and the model should be extended to units or departments that care for patients with chronic diseases and complex conditions, while complying with the laws and regulations of the Ministry of Public Health.

2. Recommendations for future research. Future studies should use randomized, controlled, blinded designs (randomized controlled trials) in specific disease groups, with larger samples, long-term follow-up, and economic evaluation of cost-effectiveness, and should explore using Thai herbs as raw materials for producing homeopathic medicines.

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Disclosure of Artificial Intelligence Use (AI Disclosure)

The author used an artificial intelligence tool (Claude, Anthropic) to assist in searching for academic sources and references. The author personally verified the accuracy of every reference before using it. The data analysis, interpretation of results, and discussion are entirely the author's own work. The artificial intelligence did not participate as a co-author.

References

1. World Health Organization. Noncommunicable diseases [Internet]. Geneva: WHO; 2023 [cited 2025 Oct 1]. Available from: https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases
2. World Health Organization. WHO traditional medicine strategy: 2014-2023. Geneva: WHO; 2013.
3. World Health Organization. WHO global report on traditional and complementary medicine 2019. Geneva: WHO; 2019.
4. Hahnemann S. Organon of medicine. 6th ed. Boericke W, translator. New Delhi: B. Jain Publishers; 2002.
5. Homoeopathic Association of Thailand. About us [Internet]. Nonthaburi: Homoeopathic Association of Thailand; [date unknown] [cited 2025 Oct 1]. Available from: http://www.thaihomeopathy.org/content/about.php (in Thai)
6. Kalasin Hospital. [Raingan pracham pi khong Rongphayaban Kalasin pi ngoppraman 2566] [Annual report of Kalasin Hospital, fiscal year 2023]. Kalasin: Kalasin Hospital; 2024. (in Thai)
7. Mathie RT, Lloyd SM, Legg LA, Clausen J, Moss S, Davidson JR, et al. Randomised placebo-controlled trials of individualised homeopathic treatment: systematic review and meta-analysis. Syst Rev. 2014;3:142.
8. Hamre HJ, Glockmann A, von Ammon K, Riley DS, Kiene H. Efficacy of homoeopathic treatment: systematic review of meta-analyses of randomised placebo-controlled homoeopathy trials for any indication. Syst Rev. 2023;12(1):191.
9. National Health and Medical Research Council. NHMRC information paper: evidence on the effectiveness of homeopathy for treating health conditions. Canberra: NHMRC; 2015.
10. Witt CM, Lüdtke R, Baur R, Willich SN. Homeopathic medical practice: long-term results of a cohort study with 3981 patients. BMC Public Health. 2005;5:115.
11. Dantas F, Rampes H. Do homeopathic medicines provoke adverse effects? A systematic review. Br Homeopath J. 2000;89 Suppl 1:S35-8.

12. Wagner EH. Chronic disease management: what will it take to improve care for chronic illness? Eff Clin Pract. 1998;1(1):2-4.
13. Epstein RM, Street RL Jr. The values and value of patient-centered care. Ann Fam Med. 2011;9(2):100-3.
14. Kemmis S, McTaggart R. The action research planner. 3rd ed. Geelong: Deakin University Press; 1988.
15. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-91.
16. Paterson C. Measuring outcomes in primary care: a patient generated measure, MYMOP, compared with the SF-36 health survey. BMJ. 1996;312(7037):1016-20.
17. Herdman M, Gudex C, Lloyd A, Janssen M, Kind P, Parkin D, et al. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). Qual Life Res. 2011;20(10):1727-36.
18. Drug Act B.E. 2510 (1967) and its amendments. Royal Gazette. 1967 Oct 20;84(Special issue 101):7. (in Thai)
19. Bloom BS. Learning for mastery. Eval Comment. 1968;1(2):1-12.
20. Grabia S, Ernst E. Homeopathic aggravations: a systematic review of randomised, placebo-controlled clinical trials. Homeopathy. 2003;92(2):92-8.
21. Riley D, Fischer M, Singh B, Haidvogl M, Heger M. Homeopathy and conventional medicine: an outcomes study comparing effectiveness in a primary care setting. J Altern Complement Med. 2001;7(2):149-59.

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RESEARCH ARTICLE

Development of a Care Model for Patients with Uncontrolled Diabetes Mellitus at Ban Uthaiwan Subdistrict Health Promoting Hospital, Lak Lueam Subdistrict, Namon District, Kalasin Province

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Abstract

This research and development study aimed to 1) explore the situation and problems in caring for patients with uncontrolled diabetes mellitus, 2) develop a care model, and 3) evaluate the model at Ban Uthaiwan Subdistrict Health Promoting Hospital, Namon District, Kalasin Province, from October 2024 to September 2025. Phase 1 involved 45 purposively selected key informants. Phase 3 was a quasi-experimental two-group pretest-posttest study of patients with type 2 diabetes and HbA1c ≥ 7%, with 30 patients each in the experimental and comparison groups. Instruments were the care model, interview guides, a self-management behavior questionnaire, and a laboratory record form. Data were analyzed using content analysis, descriptive statistics, paired t test, independent t test, and chi-square test.

Of 186 registered patients, 63.44% (118) had uncontrolled diabetes; key problems were high consumption of glutinous rice and fruits, incorrect medication use, and missed appointments. The model had six steps: assessment and shared goal setting, goal review, education and self-management support, follow-up by home ward and telemedicine, barrier evaluation, and continuous follow-up by community partners. After the intervention, the experimental group had higher self-management scores (difference 14.43, 95% CI 11.45-17.41, $p < .001$) and lower HbA1c (difference -1.03, 95% CI -1.57 to -0.49, $p < .001$) than the comparison group. The proportions achieving HbA1c < 7% were 36.67% and 10.00% ($\chi^2 = 5.96$, $p = .015$). The model was associated with better behavior and HbA1c.

Keywords: type 2 diabetes mellitus, uncontrolled blood glucose, self-management

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Introduction

Diabetes mellitus is a chronic non-communicable disease and a major public health problem worldwide. The International Diabetes Federation (IDF) reported that in 2024, 589 million adults aged 20-79 years, or about 1 in 9, were living with diabetes, and that the number is projected to rise to 853 million by 2050; diabetes causes more than 3.4 million deaths each year. In Thailand, there are approximately 6.36 million adults with diabetes.[1] The diabetes mortality rate has been rising, at 21.25, 22.68, and 24.43 per 100,000 population in 2021-2023, respectively, and the morbidity rate increased from 1,392.98 to 1,563.02 and 1,692.43 per 100,000 population, respectively.[2] Controlling blood glucose through proper self-care reduces disease severity and complications such as chronic kidney failure, stroke, blindness, coronary artery disease, and peripheral neuropathy, thereby helping to prevent disability, reduce mortality, and lessen the economic burden on the health system.[3]

In Kalasin Province, approximately 60,000 patients with diabetes were registered for treatment in fiscal year 2024, and only 25-30% had good glycemic control (the Health Data Center [HDC] indicator for good glycemic control uses the same definition as the Namon District data below), which is lower than the Ministry of Public Health target of 40%.[4] In Namon District, the incidence of new diabetes cases in fiscal years 2022-2024 was 211.18, 228.92, and 246.10 per 100,000 population, respectively, rising every year, while the proportion of patients with good glycemic control was only 13.42%, 14.61%, and 10.93%, respectively. Patients also experienced acute complications from hypoglycemia or hyperglycemia, as well as chronic complications, including stroke, coronary artery disease, diabetic retinopathy, chronic kidney disease, and chronic foot ulcers.[5] In the catchment area of Ban Uthaiwan Subdistrict Health Promoting Hospital (SHPH), 186 patients with diabetes were registered, of whom 118 (63.44%) had uncontrolled glucose (HbA1c ≥ 7%). A preliminary analysis found that some patients could not control their diet, particularly eating large amounts of glutinous rice and seasonal fruits; took medication or injected insulin incorrectly; forgot to take medication; adjusted their doses on their own; missed appointments; and stopped taking medication.

Effective diabetes control requires health behavior modification, namely dietary control, exercise, emotional management, and correct medication use, with the goals of an HbA1c of 7% or less and a pre-meal or fasting plasma glucose of 80-130 mg/dL.[3] Orem's self-care concept explains that self-care is a deliberate, goal-directed action that can be developed through learning, teaching, and supervision.[6] Factors affecting glycemic control include personal factors (age, sex, health status, duration of illness, and experience) and external factors (lifestyle, food culture, and family economic status), as well as the health service system and support from family, neighbors, and health personnel.[7] In addition, depression among patients with diabetes affects self-care,[8] and the capacity of community caregivers plays an important role in

the care of patients with chronic diseases.[9] Although the Ministry of Public Health has guidelines for operating quality chronic non-communicable disease clinics,[10] most previous studies were conducted in district hospitals or higher-level facilities. Care models for patients with uncontrolled glucose at the SHPH level that integrate self-management, follow-up visits through a Home ward and Telemedicine system, and community network partners, within the Northeastern Thai context of glutinous rice and seasonal fruit consumption, remain limited.

Given these problems and their importance, the author was interested in developing a care model for patients with uncontrolled diabetes mellitus in the catchment area of Ban Uthaiwan SHPH, Lak Lueam Subdistrict, Namon District, Kalasin Province, by applying self-care and behavior modification concepts together with the participation of a multidisciplinary team, network partners, and the community, so that patients can care for themselves to achieve glycemic control, reduce complications, and have a good quality of life. The findings are intended to provide a guide that staff and network partners can implement easily and conveniently under a single standard, and that can be scaled up to other SHPHs with similar contexts.

Research Objectives

1. To study the situation and problems in the care of patients with uncontrolled diabetes mellitus in the catchment area of Ban Uthaiwan SHPH, Lak Lueam Subdistrict, Namon District, Kalasin Province
2. To develop a care model for patients with uncontrolled diabetes mellitus in the catchment area of Ban Uthaiwan SHPH, Lak Lueam Subdistrict, Namon District, Kalasin Province
3. To evaluate the outcomes of using the care model for patients with uncontrolled diabetes mellitus in the catchment area of Ban Uthaiwan SHPH, Lak Lueam Subdistrict, Namon District, Kalasin Province

Methods

This study used a research and development (R&D) design and was conducted in the catchment area of Ban Uthaiwan SHPH, Lak Lueam Subdistrict, Namon District, Kalasin Province, from October 2024 to September 2025. It was divided into three phases: Phase 1, preparation (October-December 2024), studying the context and analyzing problems; Phase 2, implementation (January-March 2025), developing the model and preparing practitioners; and Phase 3, evaluation (April-September 2025), piloting and evaluating the model using quasi-experimental research with a two-group pretest-posttest design, without randomization between areas and without blinding. The program lasted 12 weeks (April-June 2025), and July-September 2025 was devoted to data analysis, summarizing results, and returning the findings to the area. The details are as follows:

Population

Phases 1-2 comprised patients with diabetes, family caregivers, public health personnel, the multidisciplinary team of Namon

Hospital, and village health volunteers (VHVs) in the area. Phase 3 comprised 118 patients with type 2 diabetes registered for treatment at Ban Uthaiwan SHPH whose glucose was uncontrolled (HbA1c ≥ 7%), and approximately 110 patients with type 2 diabetes and uncontrolled glucose at the comparison SHPH.

Sample

Phases 1-2: The 45 key informants comprised 20 patients with diabetes, 10 family caregivers, 5 public health personnel and multidisciplinary team members, and 10 VHVs, selected by purposive sampling. Phase 3: The sample size was calculated using G*Power[11] with an effect size of 0.80, a significance level of .05, and power of .80, yielding 26 per group; adding 15% to allow for attrition gave 30 per group (26 × 1.15 = 29.90), for a total of 60 (two-tailed test; the primary outcome was post-intervention HbA1c, with the effect size defined from a clinically important between-group difference in HbA1c of approximately 1%, which is associated with a reduced risk of microvascular complications,[12] and a standard deviation of HbA1c of 1.21 from patients in the area in Phase 1, giving d = 1.00/1.21 = 0.83, so a conservative value of 0.80 was set). The experimental group was selected from patients at Ban Uthaiwan SHPH by simple random sampling, drawing lots from a list of 82 eligible patients, of whom 30 were selected (52 were not selected). The comparison group was selected from Non Sri Sawat SHPH in Namon District, which has a similar context, and was matched by sex, age (± 5 years), and HbA1c level (a difference of no more than 0.5%).

Inclusion Criteria

1) Type 2 diabetes, aged 35-75 years (to reduce the risk of hypoglycemia in very old adults and to enable participation in the activities), diagnosed at least 1 year earlier; 2) most recent HbA1c between 7.0% and 12.0%; 3) able to communicate in Thai and without dementia; 4) having a contactable telephone (own or a relative's); and 5) willing to participate in the study

Exclusion Criteria

1) Severe complications requiring hospital treatment, such as stage 4-5 chronic kidney disease, and 2) pregnancy. The discontinuation criteria were moving out of the area, withdrawing during the study, or attending fewer than 80% of the activities. Data were analyzed by intention-to-treat, and no participants discontinued.

Research Instruments

The instruments comprised 1) the experimental instruments, namely the six-step care model for patients with uncontrolled diabetes, a care practice manual for staff and network partners, and a patient self-management logbook; and 2) the data collection instruments, namely in-depth interview and focus group guides, a general information questionnaire, a 20-item self-management behavior questionnaire with a 4-point rating scale (maximum score 80), a record form for HbA1c and fasting blood sugar (FBS), a 15-item satisfaction questionnaire with a 5-point rating scale completed by patients in the experimental group, and a 15-item knowledge test on glycemic control for patients (true/false;

passing criterion 80%) with a KR-20 of 0.78. Content validity was verified by three experts, yielding an IOC of 0.67-1.00, and the instruments were piloted with 30 patients with characteristics similar to the sample, yielding Cronbach's alpha coefficients of 0.85 for the self-management behavior questionnaire and 0.89 for the satisfaction questionnaire.

Data Collection

In Phase 1, data were reviewed from the Health Data Center (HDC) database, with observation, in-depth interviews, and focus group discussions. In Phase 2, workshops were held with the multidisciplinary team of Namon Hospital, network partners, and the community to design the model, prepare the manual, and assess its congruence, appropriateness, and feasibility. In Phase 3, the researcher and research assistants collected self-management behavior and HbA1c data in both groups before the intervention (week 1) and after the intervention (week 12). The comparison group received the usual care of the chronic non-communicable disease clinic. The data collectors were the researcher and research assistants, who knew each patient's group allocation (unblinded).

Data Analysis

Qualitative data were analyzed using content analysis. Quantitative data were analyzed using descriptive statistics, namely frequency, percentage, mean, and standard deviation. Mean scores within groups were compared using the paired t test, mean scores between groups were compared using the independent t test, and the proportions of patients achieving HbA1c control were compared using the chi-square test. Statistical significance was set at .05, two-tailed. Normality was checked with the Shapiro-Wilk test (if the data were not normal, the Wilcoxon signed-rank test and the Mann-Whitney U test were used). The primary outcome was post-intervention HbA1c. Data were analyzed using SPSS for Windows version 26.

Research Ethics

This study adhered to the principles of research ethics for human participants. The author explained the objectives, procedures, and benefits of the study to participants, who gave written informed consent. Data were kept confidential and presented in aggregate. Participants could withdraw at any time without any effect on their treatment, and the comparison group would receive the manual and care according to the model after the study ended.

Results

1. Situation and problems in the care of patients with uncontrolled diabetes mellitus

1.1 General information The key informants in Phase 1 numbered 45. There were 186 patients with diabetes registered at Ban Uthaiwan SHPH, of whom 118 (63.44%) had uncontrolled glucose. The general information of the 118 patients with uncontrolled glucose (separate from the 45 key informants) showed that most were female, 81 (68.64%), with a mean age of 61.25 years (S.D. = 8.73), a mean duration of diabetes of 8.42 years (S.D. = 4.16), and a mean

HbA1c of 8.86% (S.D. = 1.21). Of these patients, 22.03% received insulin injections.

1.2 Problems in patient care Problems were found in three areas: 1) Patients: some patients could not control their diet, particularly eating large amounts of glutinous rice and seasonal fruits; took medication and injected insulin incorrectly; forgot to take medication; adjusted their doses on their own; missed appointments; and stopped taking medication. 2) Family and community: the culture of sharing meals from a common tray within the family without separating food for the patient, and economic constraints on food choices. 3) Health service system: the lack of a unified standard of practice, incomplete coverage of continuous home follow-up, and limited participation by community network partners in patient care.

2. Results of developing the care model for patients with uncontrolled diabetes mellitus

2.1 Components of the model The model, developed through workshops with the multidisciplinary team of Namon Hospital, SHPH staff, network partners, and the community, comprises a six-step process: 1) assessing readiness, behaviors, and health status and jointly setting blood glucose control goals; 2) reviewing self-management goals, with patients choosing what they want to change; 3) providing education and self-management support; 4) follow-up visits through the Home ward and Telemedicine system; 5) assessing barriers to self-management; and 6) continuous follow-up of self-management by community network partners. Experts rated the appropriateness of the model at the highest level ($\bar{x}$ = 4.56, S.D. = 0.42; five experts; interpretation criteria: 4.51-5.00 = highest), as shown in Table 1 and Figure 1.

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Table 1 Activities according to the care model for patients with uncontrolled diabetes mellitus, Ban Uthaiwan SHPH (**12-**week program)

Week	Activities/content	Tools used	Duration	Academic rationale
1	Step 1 Assess readiness, behaviors, and health status (HbA1c, FBS, BMI) and jointly set blood glucose control goals	Self-management behavior questionnaire; self-management logbook	60 minutes	Orem's self-care concept; shared goal setting
2	Step 2 Review goals; patients choose the behaviors they wish to change (diet, medication, exercise, emotions)	Individual self-management planning form	45 minutes	Self-management
3-4	Step 3 Education and skills training: portions of glutinous rice and seasonal fruits, taking medication and injecting insulin, exercise, stress management	Diabetes care manual; food models; demonstration insulin pen	90 minutes/session	Clinical practice guideline for diabetes
5-10	Step 4 Follow-up visits through the Home ward and Telemedicine system with VHVs every 2 weeks	LINE application; fingertip glucose meter; home visit record form	30 minutes/session	Continuity of care in the community
11	Step 5 Assess barriers to self-management and adjust individual plans	Barrier record form	45 minutes	Reflection and problem solving
12	Step 6 Continued follow-up by community network partners (VHVs, relatives, community leaders) and post-intervention evaluation	Behavior questionnaire; HbA1c results; satisfaction questionnaire	60 minutes	Social support and community participation

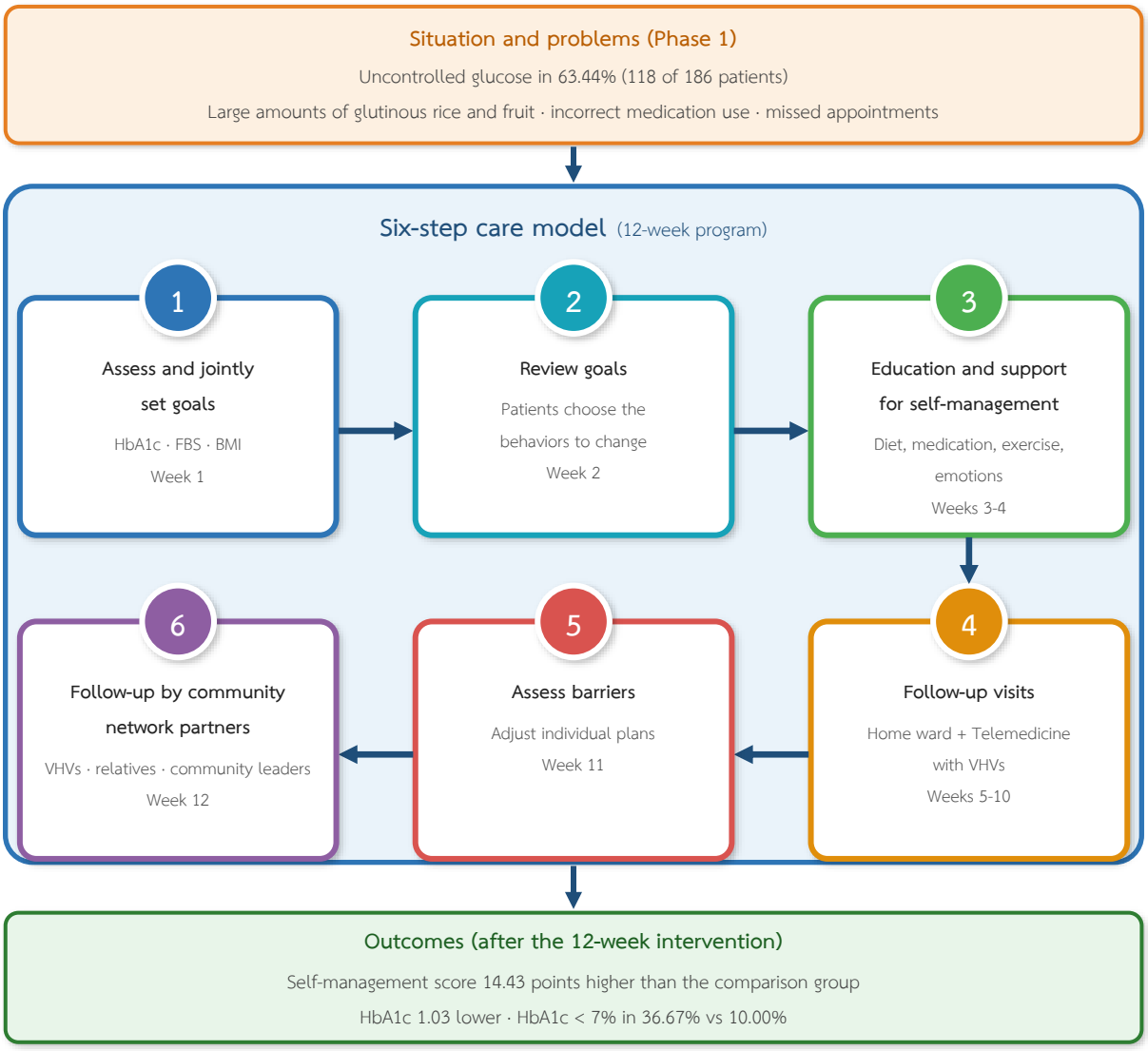


Figure 1 Care model for patients with uncontrolled diabetes mellitus, Ban Uthaiwan SHPH (six steps)

2.2 Implementation of the model A policy on the care of patients with uncontrolled diabetes was established; workshops were held to explain the model and prepare practitioners; the model was demonstrated; a flowchart of the procedures was posted; and patients and relatives were informed. Of the 5 trained staff and 20 VHVs, those whose knowledge and understanding of patient care met the criterion numbered 5 of 5 (100.00%) and 17 of 20 (85.00%), respectively (assessed with a 20-item diabetes care knowledge test; passing criterion 80%, or a score of 16 or higher).

3. Results of evaluating the use of the care model for patients with uncontrolled diabetes mellitus

3.1 Within-group comparison After the intervention, the mean self-management behavior score of the experimental group increased from 48.27 (S.D. = 6.12) to 63.53 (S.D. = 5.48) (mean difference 15.26, 95% CI 12.87-17.65, $t(29) = 13.06$, $p < .001$), and the mean HbA1c decreased from 8.92% (S.D. = 1.14) to 7.68% (S.D.

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= 0.96) (mean difference 1.24, 95% CI 0.93-1.55, t(29) = 8.18, p < .001). The comparison group showed only small changes (behavior p = .100; HbA1c p = .219), and the confidence intervals included zero, so no change could be concluded, as shown in Table 2.

Table 2 Comparison of mean self-management behavior scores and HbA1c before and after receiving the care model, by group (n = 30 per group)

Variable	Group	Before		After		Level	$\bar{d}$	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Self-management behavior (maximum score 80)	Experimental	48.27	6.12	63.53	5.48	-	15.26	12.87-17.65	13.06	<.001*
Self-management behavior (maximum score 80)	Comparison	47.83	6.35	49.10	6.02	-	1.27	-0.26 to 2.80	1.70	.100
HbA1c (%)	Experimental	8.92	1.14	7.68	0.96	-	-1.24	-1.55 to -0.93	-8.18	<.001*
HbA1c (%)	Comparison	8.85	1.08	8.71	1.12	-	-0.14	-0.37 to 0.09	-1.26	.219

*Statistically significant, p-value < .05

3.2 Between-group comparison Before the intervention, the two groups did not differ in mean self-management behavior score or HbA1c (p = .786 and .808). After the intervention, the experimental group had a higher mean self-management behavior score (difference 14.43, 95% CI 11.45-17.41, t(58) = 9.71, p < .001) and a lower mean HbA1c than the comparison group (difference -1.03, 95% CI -1.57 to -0.49, t(58) = -3.82, p < .001). Comparing the changes from before the intervention, the between-group difference was 13.99 for behavior (95% CI 11.21-16.77) and -1.10 for HbA1c (95% CI -1.48 to -0.72) (the S.D. of the change scores was back-calculated from the confidence intervals of the paired t test), as shown in Table 3.

Table 3 Comparison of mean self-management behavior scores and HbA1c between the experimental and comparison groups

Variable	Experimental group		Comparison group		Level	$\bar{d}$	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Self-management behavior, before (maximum score 80)	48.27	6.12	47.83	6.35	-	0.44	-2.78 to 3.66	0.27	.786
Self-management behavior, after (maximum score 80)	63.53	5.48	49.10	6.02	-	14.43	11.45-17.41	9.71	<.001*

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Variable	Experimental group		Comparison group		Level	$\bar{d}$	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.					
HbA1c, before (%)	8.92	1.14	8.85	1.08	-	0.07	-0.50 to 0.64	0.24	.808
HbA1c, after (%)	7.68	0.96	8.71	1.12	-	-1.03	-1.57 to -0.49	-3.82	<.001*
Self-management behavior, change	15.26	6.40	1.27	4.10	-	13.99	11.21-16.77	10.08	<.001*
HbA1c, change	-1.24	0.83	-0.14	0.62	-	-1.10	-1.48 to -0.72	-5.83	<.001*

*Statistically significant, p-value < .05

3.3 Glycemic control status After the intervention, 11 patients (36.67%) in the experimental group achieved an HbA1c below 7%, higher than the 3 patients (10.00%) in the comparison group (proportion difference 26.67 percentage points, 95% CI 6.35-46.98; $\chi^2(1) = 5.96$, p = .015; Fisher's exact p = .030), as shown in Table 4.

Table 4 Comparison of HbA1c control status after the intervention between the experimental and comparison groups

HbA1c control status	Experimental group n (%)	Comparison group n (%)	χ^2	p-value
Controlled (HbA1c < 7%)	11 (36.67)	3 (10.00)	5.96	.015
Uncontrolled (HbA1c ≥ 7%)	19 (63.33)	27 (90.00)		

3.4 Outcomes by success indicators In the experimental group, 25 patients (83.33%) passed the criterion for knowledge of glycemic control (assessed with the 15-item knowledge test; passing criterion 80%) (target 80%). Satisfaction with the model was at the highest level ($\bar{x}$ = 4.52, S.D. = 0.48), with 93.33% (28 of 30 experimental-group patients) satisfied at a high level or above (target 90%). No acute complications requiring hospital admission occurred in the experimental group (0 of 30; 95% CI 0-11.57). Hypoglycemia data were not collected, and no such data are available for the comparison group.

Discussion

The situation analysis found that most patients with diabetes in the area had uncontrolled glucose, which is consistent with Namon District data showing that only 10.93-14.61% of patients had good glycemic control.[5] The key problems arose from the consumption of glutinous rice and seasonal fruits, which is a way of life in Northeastern communities, together

with incorrect medication use, self-adjustment of medication, and missed appointments. This is consistent with previous studies finding that dietary behavior, medication use, and social support were associated with uncontrolled glycated hemoglobin.[7] In addition, the culture of sharing meals from a common tray within the family, economic constraints, and patients' psychological conditions[8] all make behavior change difficult, so a care model that takes account of the specific context of the area is necessary.

The developed model is appropriate because it was developed from the actual problems of the area, with the participation of the multidisciplinary team, SHPH staff, network partners, and the community, and it applied Orem's self-care concept, which aims to develop self-care ability through learning, teaching, and supervision.[6] The six-step process begins with assessment and shared goal setting, which lets patients choose the behaviors they wish to change themselves, thereby generating motivation and responsibility for self-management. Meanwhile, follow-up visits through the Home ward and Telemedicine system together with VHVs and family caregivers ensured continuity of care at home, which is consistent with the guidelines for operating quality chronic non-communicable disease clinics[10] and with developing the capacity of community caregivers of patients with chronic diseases.[9] These results are consistent with the development of an integrated, community-participation care model for patients with uncontrolled diabetes at Nong Phalan SHPH, in which HbA1c decreased after 3 months of activities,[13] and with a telenursing model for patients with type 2 diabetes, in which the experimental group had better health behaviors and lower HbA1c than the control group.[14]

After the model was used, the experimental group's self-management behavior scores increased and its HbA1c decreased, and both were better than in the comparison group. This may be explained by education aligned with local lifestyles, such as setting portions of glutinous rice and seasonal fruits and training in medication use and insulin injection, together with close follow-up and support from community network partners, which likely helped patients sustain their behaviors; this is associated with lower blood glucose approaching the targets in the clinical practice guidelines.[3] The mean HbA1c reduction in the experimental group of about 1.24% (a net effect of about 1.10 relative to the comparison group) may be clinically important for delaying microvascular complications, since each 1% reduction in HbA1c is associated with a 37% lower risk of microvascular complications.[12] However, the effect sizes for behavior (Cohen's d = 2.51) and HbA1c (d = 0.99) were rather large and may have been influenced by self-reporting, the lack of blinding, and differences between areas, so the results should be interpreted with caution.

The limitations of this study were as follows: it was unblinded and the data collector was the researcher; the behavior indicators were self-reported; medication adjustment and seasonality were not controlled; the follow-up period was rather short (12 weeks); the comparison group

came from a different area and was not randomized; and the sample was small and from a single area. In addition, the sample size was calculated with an effect size of 0.80, which is higher than the mean HbA1c difference in a systematic review of self-management education and support (0.76 percentage points, or d ≈ 0.63),[15] so the power would be about 67% if the true effect size were at that level. Therefore, caution is needed in generalizing the results to other populations.

Conclusion

Most patients with diabetes in the Ban Uthaiwan SHPH catchment area had uncontrolled glucose, owing to consumption behaviors typical of the Isan way of life, incorrect medication use, and a lack of continuous follow-up. The care model developed has six steps, emphasizing joint goal setting, self-management support, follow-up through the Home ward and Telemedicine system, and the participation of community network partners. Use of the model was associated with better self-management behavior and a lower HbA1c than in the comparison group, but causal conclusions cannot be drawn because this was a non-randomized, unblinded quasi-experimental study.

Recommendations

1. Recommendations for applying the findings: 1) SHPHs and the Namon District health service network should establish a policy and implement the model in chronic non-communicable disease clinics, adapting it to the context of each area; 2) the capacity of VHVs and family caregivers should be developed so that they can follow up patients continuously; and 3) equipment and communication systems for Telemedicine follow-up should be supported.

2. Recommendations for future research: 1) long-term follow-up of at least 6-12 months should be conducted to assess the sustainability of behavior and the occurrence of complications; 2) randomized controlled studies should be conducted in multiple areas; and 3) the costs and effectiveness of the model should be studied.

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AI Disclosure

The author used an artificial intelligence tool (Claude, Anthropic) to assist in searching for academic sources and references. The author personally verified the accuracy of every reference before using it. The data analysis, interpretation of results, and discussion are

entirely the author's own work. Artificial intelligence did not participate as a co-author.

References

1. International Diabetes Federation. IDF Diabetes Atlas [Internet]. 11th ed. Brussels: International Diabetes Federation; 2025 [cited 2025 Sep 1]. Available from: https://diabetesatlas.org/
2. Division of Epidemiology, Department of Disease Control, Ministry of Public Health. Annual epidemiological surveillance report 2024. Bangkok: The Agricultural Cooperative Federation of Thailand Printing; 2024. (in Thai)
3. Diabetes Association of Thailand. Clinical practice guideline for diabetes 2017. Bangkok: Diabetes Association of Thailand; 2017. (in Thai)
4. Kalasin Provincial Public Health Office. Health Data Center (HDC): diabetes control indicators, fiscal year 2024 [Internet]. Kalasin: Kalasin Provincial Public Health Office; 2024 [cited 2025 Sep 1]. Available from: https://kls.hdc.moph.go.th (in Thai)
5. Nursing Department, Namon Hospital. Report of diabetes patients from the Health Data Center (HDC) database. Kalasin: Namon Hospital; 2024. (in Thai)
6. Orem DE. Nursing: concepts of practice. 6th ed. St. Louis: Mosby; 2001.
7. Phanareewattana D. Factors associated with uncontrolled glycated hemoglobin among type 2 diabetic patients in Bang Phae Hospital, Ratchaburi Province. Reg 4-5 Med J. 2018;37(4):294-305. (in Thai)
8. Thanakwang K. Research on depression among patients with diabetes in Thailand. Nonthaburi: Health Systems Research Institute; 2024. (in Thai)
9. Phimpho B. Development of caregivers' potential for chronic disease patients in Phai Lom Subdistrict community, Laplae District, Uttaradit Province [master's thesis]. Chiang Mai: Chiang Mai University; 2014. (in Thai)
10. Bureau of Non-Communicable Diseases, Department of Disease Control. Manual for assessing quality NCD clinic operations, fiscal year 2020. Nonthaburi: Department of Disease Control; 2020. (in Thai)
11. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-91.
12. Stratton IM, Adler AI, Neil HA, Matthews DR, Manley SE, Cull CA, et al. Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. BMJ. 2000;321(7258):405-12.
13. Phasom M. Development of a care model for uncontrolled diabetes patients in the diabetes clinic of Nong Phalan Subdistrict Health Promoting Hospital, Nong Rawiang Subdistrict, with integrated community participation. J Environ Educ Med Health. 2023;8(3):20-30. (in Thai)
14. Prakosantang N. Effects of a telenursing model on glycemic control among patients with type 2 diabetes. J Res Health Innov Dev. 2024;5(2):100-11. (in Thai)
15. Norris SL, Lau J, Smith SJ, Schmid CH, Engelgau MM. Self-management education for adults with type 2 diabetes: a meta-analysis of the effect on glycemic control. Diabetes Care. 2002;25(7):1159-71.

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RESEARCH ARTICLE

Development of a Discharge Planning Model for Postpartum Mothers Using Methamphetamine, Namon Hospital, Kalasin Province

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Abstract

This action research aimed to 1) study the situation, 2) develop, and 3) preliminarily evaluate a discharge planning model for postpartum mothers using methamphetamine at Namon Hospital, Kalasin Province, from April 2024 to September 2025, using two cycles of planning, action, observation, and reflection (PAOR). Participants were 14 co-developers, 8 postpartum mothers who received care under the model, and 8 historical comparison mothers who received conventional discharge planning. Instruments included the D-METHOD-P model, knowledge and practice tests, a self-care behavior questionnaire, a discharge planning completeness checklist, and the Readiness for Hospital Discharge Scale. Data were analyzed using descriptive statistics, paired t test, independent t test, Fisher's exact test, and content analysis.

The model comprised eight D-METHOD-P components integrated with Gordon's functional health patterns assessment and community referral. After implementation, nurses' knowledge increased by 5.29 points (95% CI 4.12-6.45, $p < .001$) and mothers' self-care behavior by 17.00 points (95% CI 14.14-19.86, $p < .001$). The post-development group had higher discharge planning completeness (difference 5.75, 95% CI 4.06-7.44, $p < .001$) and a shorter hospital stay (difference -1.25 days, 95% CI -2.19 to -0.31, $p = .013$). Postpartum visit attendance (8/8 vs 4/8) and methamphetamine relapse (2/8 vs 5/8) did not differ significantly ($p = .077$ and .315). In conclusion, the model was associated with higher knowledge, self-care behavior, and discharge planning completeness and a shorter hospital stay than the historical comparison group, but no statistically significant difference was found in post-discharge clinical outcomes, so its effectiveness on these outcomes remains unconfirmed. These are preliminary findings from a small sample with a historical comparison group and should be confirmed by prospective controlled studies.

Keywords: discharge planning, postpartum mothers, methamphetamine, D-METHOD-P

Introduction

Drug use is a major global problem. The World Drug Report of the United Nations Office on Drugs and Crime (UNODC) indicates that the number of people who use drugs worldwide continues to rise, with an estimated 292 million users in 2022 (World Drug Report 2024), and East and Southeast Asia remain a major region for the production and spread of methamphetamine.[1] In Thailand, methamphetamine (yaba) offenders account for the largest share of drug cases, and methamphetamine use among pregnant women is increasing.[2] Methamphetamine is a central nervous system stimulant that crosses the placenta and causes vasoconstriction, which reduces the delivery of nutrients and oxygen to the fetus. Use during pregnancy therefore increases the risk of preeclampsia, placental abruption, fetal growth restriction, preterm birth, and low birth weight.[3,4] Studies in Thailand have found that infants born to mothers who use methamphetamine have higher rates of prematurity, jaundice, hypoglycemia, and withdrawal symptoms,[5,6] and that mothers and infants stay in hospital longer than those not exposed to drugs.[7]

Namon Hospital in Kalasin Province is a 30-bed community hospital that provides normal delivery services for mothers without obstetric risk. Between 2018 and 2020, it recorded 4, 3, and 5 pregnant women who used methamphetamine, respectively; most smoked the drug, and some were exposed through close contacts at home who used it.[8] The hospital has also seen a rising trend in preterm births and infants weighing less than 2,500 grams: in 2020, of 99 normal deliveries, 4.04% were preterm and 3.03% of infants had low birth weight, and in 2023 about 40-50 women per year (8-10% of deliveries) presented with preterm labor.[8] A review with the multidisciplinary team of the Maternal and Child Health (MCH) Board found that discharge planning for postpartum mothers using methamphetamine had no clear model and no written practice guideline. Mothers did not receive individualized planning before discharge and lacked continuity of care in the community, which resulted in limited knowledge, inappropriate self-care behavior, infection, readmission, and relapse to substance use.

Discharge planning is a continuous process that begins at admission and continues through discharge and the transfer of care to the community. The concept of readiness for hospital discharge by Weiss and Piacentine holds that the quality of predischarge teaching, in both content and delivery, predicts readiness for discharge and post-discharge outcomes.[9,10] The D-METHOD framework, widely used in nursing in Thailand, covers disease, medication, environment, treatment, health, outpatient follow-up, and diet.[11] Assessment using Gordon's 11 functional health patterns allows a comprehensive evaluation of the physical, psychological, and social problems of women who use drugs.[12] The World Health Organization recommends screening, brief counseling, and referral to treatment for women who use drugs during pregnancy and the postpartum period.[13] However, most previous studies have examined pregnancy outcomes in tertiary hospitals, and little work has developed a discharge planning model that adds mental health and relapse

prevention and suits the context of community hospitals.

As the head nurse of the labor room, the author therefore developed a discharge planning model for postpartum mothers using methamphetamine by adapting the D-METHOD concept and adding a component for psychological assessment and relapse prevention, creating D-METHOD-P. The author used an action research process together with the multidisciplinary team so that mothers receive standard, safe care that continues into the community. The findings are expected to serve as a guide for labor room staff caring for this group of mothers, to reduce readmission and relapse, and to be scaled up to service networks in the area.

Research Objectives

1. To study the situation of discharge planning for postpartum mothers using methamphetamine at Namon Hospital, Kalasin Province
2. To develop a discharge planning model for postpartum mothers using methamphetamine at Namon Hospital, Kalasin Province
3. To evaluate the outcomes of the developed discharge planning model for postpartum mothers using methamphetamine

Methods

This action research followed the concept of Kemmis and McTaggart[14] and comprised planning, action, observation, and reflection over 2 cycles. It was conducted in the labor room and postpartum ward of Namon Hospital, Kalasin Province, from April 2024 to September 2025, in 3 phases: Phase 1, situation analysis (April-June 2024); Phase 2, development and implementation of the model (July 2024 to June 2025; cycle 1, July-December 2024, and cycle 2, January-June 2025); and Phase 3, evaluation and summary (July-September 2025). Details are as follows. Phase 3 was a preliminary (pilot) evaluation comparing the post-development group with a historical control group.

Population

The population comprised 1) professional nurses and members of the multidisciplinary team who care for mothers and infants at Namon Hospital, and 2) postpartum mothers using methamphetamine who gave birth at Namon Hospital, Kalasin Province.

Sample

Participants were selected by purposive sampling and divided into 3 groups: 1) 14 co-developers of the model, consisting of 10 professional nurses from the labor room and postpartum ward, 1 physician, 1 pharmacist, 1 person responsible for drug abuse and mental health work, and 1 professional nurse from the family and community practice unit; 2) 8 postpartum mothers using methamphetamine who received care under the developed model (post-development group), who were all of the mothers who gave birth during the study period; and 3) 8 postpartum mothers using methamphetamine who received conventional discharge planning (pre-development group) between October 2021 and March 2024, who were all of the eligible mothers with complete medical records, out of 10 mothers using methamphetamine in total (2 had incomplete

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records). Data were obtained from medical records. Because the population was small, all eligible mothers were studied and no sample size was calculated. A sample of 8 per group has 80% power only when the effect size (d) is about 1.5 or greater. The 8 mothers in the post-development group comprised 3 who received the draft model and 5 who received the revised model.

Inclusion Criteria

1) Co-developers: worked in a relevant unit for at least 1 year and were willing to participate in the research. 2) Mothers: had a history of methamphetamine use during pregnancy, based on history taking or a urine test positive for methamphetamine; gave birth at Namon Hospital; were conscious; could communicate in Thai; could be contacted by telephone; and gave consent to participate. For mothers under 18 years of age, consent was obtained from a parent or guardian.

Exclusion Criteria

1) Co-developers: transferred, took study leave, or could not complete the activities. 2) Mothers: had severe complications requiring referral to the parent hospital before discharge, had severe psychiatric symptoms that prevented them from providing information, or withdrew from the research.

Research Instruments

The instruments comprised 1) intervention tools: the discharge planning model for postpartum mothers using methamphetamine based on the D-METHOD-P concept, nursing practice guidelines, Gordon's 11 functional health patterns assessment form,[12] a postpartum self-care handbook for mothers, and a home visit referral form; and 2) data collection tools: a general information questionnaire, a 20-item nurse knowledge test, a 30-point nurse practice assessment form for the model, a 20-item maternal knowledge test, a 20-item postpartum self-care behavior assessment (4-point rating scale, total score 80), a 16-item discharge planning completeness checklist based on medical records, the Readiness for Hospital Discharge Scale of Weiss and Piacentine[9] (Thai version translated by the researcher using back translation, with content validity checked by 3 experts; Cronbach's alpha coefficient 0.88; score range 0-10), a 5-level satisfaction questionnaire, and focus group discussion guidelines. The instruments were checked for content validity by 3 experts, with index of item-objective congruence (IOC) values of 0.67-1.00. The knowledge tests had KR-20 reliability coefficients of 0.82 and 0.80, and the self-care behavior and satisfaction questionnaires had Cronbach's alpha coefficients of 0.86 and 0.89, respectively.[15]

Data Collection

The researcher and 2 briefed research assistants collected the data. The research assistants, who did not provide nursing care to the mother concerned, assessed the maternal outcomes. Phase 1: reviewed medical records and retrospective statistics, held focus group discussions with the multidisciplinary team, and assessed nurses' knowledge before development. Phase 2: held workshops and applied the model to every mother from admission through discharge; assessed mothers' knowledge and self-care behavior at admission and before discharge (days 2-3 postpartum); assessed readiness for discharge on the day of discharge; conducted

home visits together with sub-district health promoting hospitals (SHPHs) and village health volunteers (VHVs); and followed up by telephone at 7 days, 28 days, 6 weeks, and 3 months after discharge. Practice was observed and recorded, and the results were reflected on to improve the model in cycle 2. Phase 3: assessed nurses' knowledge and practice after development, audited medical records for comparison with the pre-development group, and assessed satisfaction.

Data Analysis

General data were analyzed using descriptive statistics: frequency, percentage, mean, and standard deviation. Mean scores before and after development within groups were compared using the paired t test, the post-development and pre-development groups were compared using the independent t test, and categorical outcomes were compared using Fisher's exact test because the sample size was small. Normality was tested with the Shapiro-Wilk test, and the data were normally distributed ($p > .05$). All tests were two-tailed, and the Wilcoxon signed-rank test and Mann-Whitney U test were run alongside to confirm the results. The level of statistical significance was set at .05. Qualitative data were analyzed using content analysis.

Research Ethics

This study took human research ethics into account. The author explained the objectives, procedures, benefits, and risks of the study to participants, who signed consent forms to participate voluntarily. For mothers under 18 years of age, consent was also obtained from a parent or guardian, together with the mother's own assent. If a risk to the infant's safety was found, the researcher acted in accordance with the Child Protection Act B.E. 2546 (2003), of which participants were informed in advance in the information sheet. Information on substance use was kept confidential, codes were used instead of names, results were presented in aggregate, and no information was disclosed to law enforcement agencies. Participants could withdraw at any time without any effect on the medical care they were entitled to receive.

Results

1. Situation of discharge planning for postpartum mothers using methamphetamine

1.1 General characteristics of the sample

The 14 co-developers of the model were mostly female (92.86%), with a mean age of 38.64 years (S.D. = 7.12) and mean work experience of 13.21 years (S.D. = 6.85); 71.43% had never received training on the care of mothers who use drugs. The 8 mothers in the post-development group had a mean age of 21.38 years (S.D. = 4.17); 37.50% were adolescents under 20 years of age, 75.00% had incomplete antenatal care according to the criteria, 87.50% used methamphetamine by smoking, and 62.50% had a spouse or family member who also used drugs. Two mothers (25.00%) delivered preterm, and 3 (37.50%) had infants weighing less than 2,500 grams. The pre-development group had a mean age of 22.13 years (S.D. = 4.52), which did not differ from that of the post-development group ($t(14) = -0.34$, $p = .736$); however, with a sample of 8 per group, this result is not evidence that the two groups were equivalent.

1.2 **Problems with discharge planning before development** A review of medical records and the focus groups identified 4 main problems: 1) there was no written model or practice guideline for discharge planning for mothers who use drugs, and nurses practiced differently according to their experience; 2) problem assessment was not comprehensive, especially for psychological aspects, depression, withdrawal symptoms, and the family environment; 3) predischarge teaching focused on general postpartum care and not on relapse prevention, contraception, and care of high-risk infants; and 4) there was no system for passing information to SHPHs, VHVs, and community drug treatment teams, so mothers lacked continuing follow-up. The pre-development group had discharge planning documented completely for an average of only 8.88 of 16 items and received an average of 1.25 post-discharge follow-ups.

2. Discharge planning model for postpartum mothers using methamphetamine

2.1 **Components of the model** The model that was developed is named D-METHOD-P. It has 8 components and is carried out from admission to the labor room through follow-up in the community, using Gordon's 11 functional health patterns assessment as the tool for assessing problems at admission, as shown in Table 1 and Figure 1.

Table 1 Components of the discharge planning model for postpartum mothers using methamphetamine (D-METHOD-P)

Component	Activities/Content	Tools used	Duration	Scientific rationale
D: Diagnosis	Education on childbirth and on complications of substance use for mothers and infants, and individual counseling for every mother	11 functional health patterns assessment form, mother's handbook	30 minutes	D-METHOD concept[11] and discharge readiness[9]
M: Medicine	Advice on medication use, iron supplements, medical treatment, and avoiding medicines that affect breastfeeding	Medication leaflet	15 minutes	D-METHOD concept[11]

Component	Activities/Content	Tools used	Duration	Scientific rationale
E: Environment/ Economic	Assessment of the home environment, family members who use drugs, and sources of social and economic support	Family assessment form, network map	20 minutes	WHO[13]
T: Treatment	Teaching on monitoring for postpartum abnormalities and infant withdrawal symptoms, wound care, and returning to hospital when abnormal symptoms occur	Abnormal symptoms checklist, visual media	20 minutes	D-METHOD concept[11]
H: Health	Skills training in postpartum self-care, breastfeeding, and contraception, and building motivation to quit using	Demonstration manikin, mother's handbook	30 minutes/day	Weiss and Piacentine[9,10]
O: Outpatient/Referral	Scheduling postpartum and infant check-ups, transferring information to SHPHs, VHVs, and drug treatment clinics, and follow-up home visits	Home visit referral form, network LINE group	15 minutes	WHO[13]

Component	Activities/Content	Tools used	Duration	Scientific rationale
D: Diet	Advice on a diet from all 5 food groups for postpartum and breastfeeding mothers, avoiding alcohol, cigarettes, and caffeinated drinks	Sample menus	15 minutes	D-METHOD concept[11]
P: Psychological	Assessment of depression, psychiatric symptoms, and withdrawal symptoms; motivational counseling; and coordination with the M-CATT team	2Q/9Q screening forms, substance use screening form	30 minutes	WHO[13]

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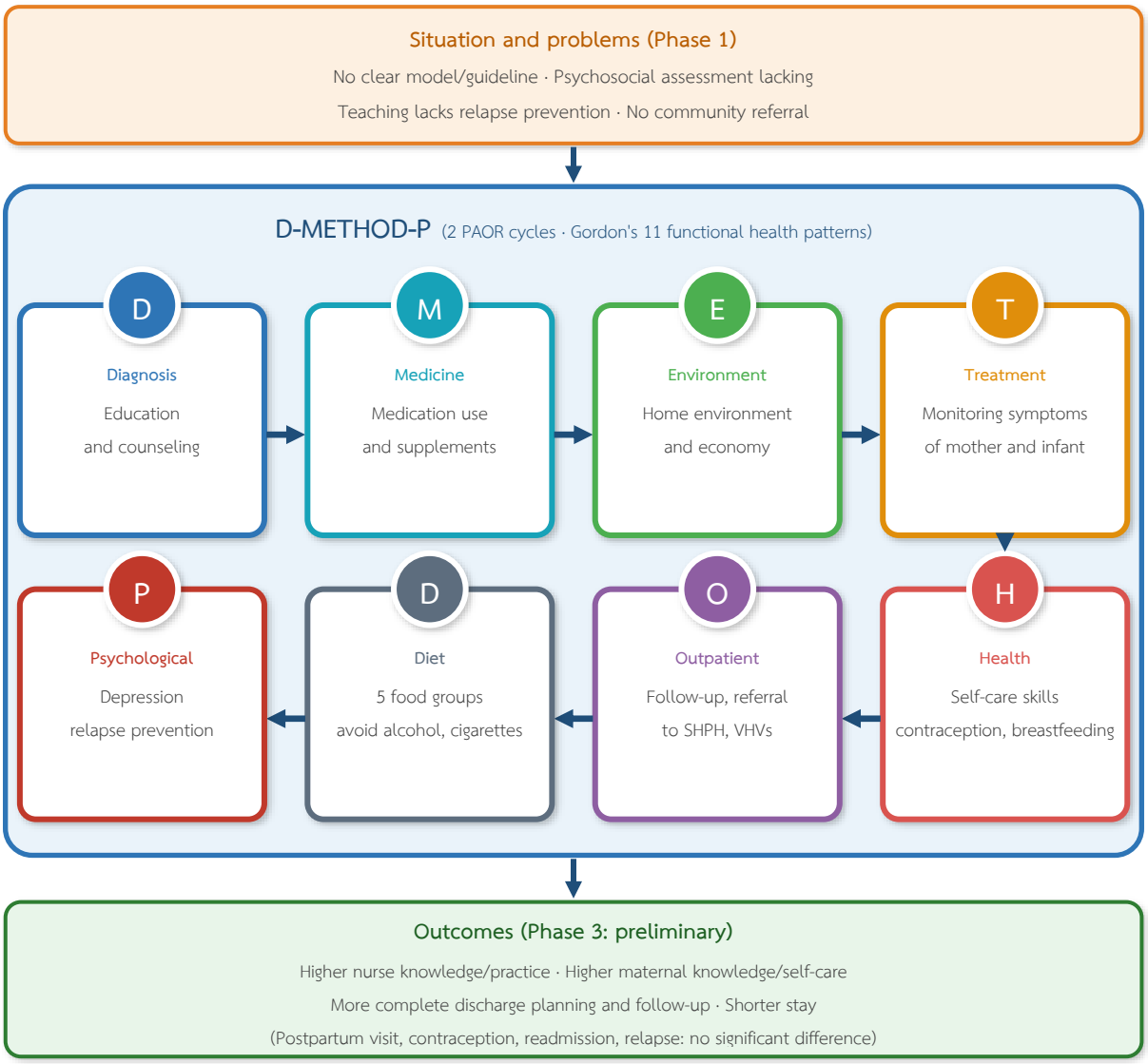


Figure 1 **Discharge planning model for postpartum mothers using methamphetamine** (D-METHOD-P)

2.2 **Results of model development across the cycles** Cycle 1 (July-December 2024): the draft model was applied to 3 mothers. Problems found were that the assessment form was redundant and time-consuming, some mothers were discharged before completing the teaching, and the transfer of information to the community was delayed. The team reflected on these findings and made improvements in cycle 2 (January-June 2025) by: 1) changing the assessment form to a checklist used together with the electronic medical record; 2) setting a daily teaching schedule starting on the first day postpartum; 3) producing a handbook and visual media for mothers and relatives; 4) sending information through the home visit system and the SHPH network LINE group within 24 hours after discharge; and 5) adding coordination with the M-CATT team and the hospital's drug treatment clinic. The revised model was applied to 5 mothers, and nurses were able to carry it out completely and more conveniently.

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3. Outcomes of the discharge planning model for postpartum mothers using methamphetamine

3.1 Comparison of mean scores before and after development After the model was implemented, nurses' mean knowledge score increased from 12.43 (S.D. = 2.44) to 17.71 (S.D. = 1.59) (mean difference 5.29, 95% CI 4.12-6.45, t(13) = 9.81, p < .001), and their model practice score increased from 21.50 (S.D. = 2.88) to 27.36 (S.D. = 1.82) (mean difference 5.86, 95% CI 4.50-7.21, t(13) = 9.33, p < .001). Mothers' mean predischarge knowledge score increased from 9.75 (S.D. = 2.19) to 16.50 (S.D. = 1.85) (mean difference 6.75, 95% CI 5.15-8.35, t(7) = 10.00, p < .001), and their self-care behavior score increased from 48.25 (S.D. = 6.76) to 65.25 (S.D. = 5.09) (mean difference 17.00, 95% CI 14.14-19.86, t(7) = 14.05, p < .001) (effect size dz = 2.49-4.97, which is quite large; the Wilcoxon signed-rank test run alongside gave consistent results, with p = .008 for the mothers and p < .001 for the nurses), as shown in Table 2.

Table 2 Comparison of mean knowledge and practice scores of nurses, and mean knowledge and self-care behavior scores of mothers, before and after model development

Variable	Group	Before		After		Level	$\bar{d}$	95%CI	t (df)	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Knowledge (max 20)	Nurses (n = 14)	12.43	2.44	17.71	1.59	-	5.29	4.12 to 6.45	9.81 (df = 13)	<0.001*
Model practice (max 30)	Nurses (n = 14)	21.50	2.88	27.36	1.82	-	5.86	4.50 to 7.21	9.33 (df = 13)	<0.001*
Knowledge (max 20)	Mothers (n = 8)	9.75	2.19	16.50	1.85	-	6.75	5.15 to 8.35	10.00 (df = 7)	<0.001*
Self-care behavior (max 80)	Mothers (n = 8)	48.25	6.76	65.25	5.09	-	17.00	14.14 to 19.86	14.05 (df = 7)	<0.001*

*Statistically significant, p-value <.05

3.2 Comparison of outcomes between the post-development and pre-development groups The post-development group had a higher discharge planning completeness score than the pre-development group (14.63, S.D. = 1.06 vs 8.88, S.D. = 1.96; difference 5.75, 95% CI 4.06-7.44, t(14) = 7.30, p < .001), a higher score for coverage of the 11 functional health patterns assessment (10.13 vs 5.38; difference 4.75, 95% CI 3.16-6.34, p < .001), more post-discharge follow-ups within 6 weeks (3.88 vs 1.25; difference 2.63, 95% CI 1.70-3.55, p < .001), and a shorter hospital stay (3.13 vs 4.38 days; difference -1.25, 95% CI -2.19 to -0.31, t(14) = -2.85, p = .013), as shown in Table 3. Discharge planning completeness and the number of follow-ups are process indicators consistent with the components of the model, not clinical outcomes. In addition, the post-

development group had a mean readiness-for-hospital-discharge score of 8.06 (S.D. = 0.63 out of 10; 95% CI 7.53-8.59) and rated satisfaction with the model at the highest level ($\bar{x}$ = 4.51, S.D. = 0.31; 95% CI 4.25-4.77; the respondents were the 8 mothers in the post-development group).

Table 3 Comparison of discharge planning outcomes between the post-development and pre-development groups (n=8 per group)

Variable	Post-development group (n = 8)		Pre-development group (n = 8)		Level	$\bar{d}$	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Discharge planning completeness (max 16)	14.63	1.06	8.88	1.96	-	5.75	4.06 to 7.44	7.30	<0.001*
Coverage of 11-pattern assessment (max 11)	10.13	0.83	5.38	1.92	-	4.75	3.16 to 6.34	6.41	<0.001*
Number of follow-ups within 6 weeks (times)	3.88	0.83	1.25	0.89	-	2.63	1.70 to 3.55	6.10	<0.001*
Maternal length of hospital stay (days)	3.13	0.64	4.38	1.06	-	-1.25	-2.19 to -0.31	-2.85	0.013*

*Statistically significant, p-value <.05

3.3 Clinical outcomes after discharge

Within 6 weeks, 8 of 8 mothers (100.00%) in the post-development group attended the postpartum visit, compared with 4 of 8 (50.00%) in the pre-development group (p = .077); 7 of 8 (87.50%) and 3 of 8 (37.50%), respectively, received semi-permanent contraception (p = .119). There was no readmission within 28 days (0 of 8), compared with 2 of 8 (25.00%) in the pre-development group (p = .467), and relapse to substance use within 3 months occurred in 2 of 8 (25.00%) compared with 5 of 8 (62.50%) (p = .315). None of the indicators differed significantly, and the confidence intervals were very wide (for example, a difference in relapse of -37.50 percentage points), so no difference or trend can be concluded from such a small sample, as shown in Table 4.

Table 4 Comparison of clinical outcomes after discharge between the post-development and pre-development groups

Outcome	Post-development group n/N (%)	Pre-development group n/N (%)	Test	p-value
Attended postpartum visit within 6 weeks	8/8 (100.00)	4/8 (50.00)	Fisher's exact	0.077

Outcome	Post-development group n/N (%)	Pre-development group n/N (%)	Test	p-value
Received semi-permanent contraception	7/8 (87.50)	3/8 (37.50)	Fisher's exact	0.119
Readmitted within 28 days	0/8 (0.00)	2/8 (25.00)	Fisher's exact	0.467
Relapsed to substance use within 3 months	2/8 (25.00)	5/8 (62.50)	Fisher's exact	0.315

Discussion

Before development, discharge planning for postpartum mothers using methamphetamine had no clear model, assessment did not cover psychosocial aspects, and there was no connection to the community. This is consistent with the characteristics of this group of mothers, who often have incomplete antenatal care, are young, and have family members who use drugs, putting both mother and infant at risk of complications.[5,7] Conventional discharge planning that focuses on teaching general postpartum care was therefore insufficient for the complex needs of these mothers, for whom the World Health Organization recommends systematic screening, counseling, and referral to treatment.[13]

The D-METHOD-P model was developed through the participation of the multidisciplinary team over 2 PAOR cycles, which made it suited to the context of a community hospital and practicable, in line with the action research concept that emphasizes continuous reflection and improvement.[14] Adding the mental health component (P) extended coverage to screening for depression, withdrawal symptoms, and relapse prevention, while the use of Gordon's functional health patterns allowed problems to be assessed across all dimensions,[12] which was associated with higher nurse knowledge and practice scores (causal conclusions cannot be drawn because a single group was measured before and after).

After the model was used, mothers had higher knowledge, self-care behavior, and readiness for discharge, which can be explained by the concept of Weiss and Piacentine that the quality of predischarge teaching, in both content and delivery, affects readiness for discharge and post-discharge outcomes.[9,10] Daily teaching combined with skills training and visual media helped mothers understand and practice what they were taught, and the transfer of information to SHPHs, VHVs, and the drug treatment clinic gave mothers continuing follow-up. All mothers attended the postpartum visit, but this did not differ significantly from the pre-development group, and no conclusion can be drawn about relapse and readmission.

The limitations of this study were the small sample size; the comparison group being retrospective data from medical records measured with different instruments; the lack of blinding of assessors, with the researcher also

delivering the intervention; the combining of the draft and revised versions of the model; and a follow-up period of only 3 months. The results should therefore be interpreted with caution.

Conclusion

The D-METHOD-P discharge planning model for postpartum mothers using methamphetamine, developed with the participation of the multidisciplinary team, comprises 8 components. After the model was used, nurses had higher knowledge and practice scores, and mothers had higher knowledge and self-care behavior scores before discharge. The post-development group had more complete discharge planning, received more continuing follow-up into the community, and had a shorter hospital stay than the pre-development group, which consisted of historical data. Postpartum visit attendance, contraception, readmission, and relapse to substance use did not differ significantly. All of the findings are preliminary and come from a small sample.

Recommendations

1. Recommendations for applying the findings: The D-METHOD-P model should be adopted as a practice guideline for the labor room and postpartum ward, starting from the antenatal period. Nurses in SHPHs should be trained so that the model can be scaled up to service networks in the area, and indicators should be reviewed periodically together with the district quality of life development team to address drug problems in families and communities.

2. Recommendations for future research: Future studies should use larger samples or multiple hospitals in the province, a quasi-experimental design with a prospective control group, and longer follow-up of 6-12 months covering relapse, repeat pregnancy, and infant development.

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AI Disclosure

The author used an artificial intelligence tool (Claude, Anthropic) to help search for academic sources and references. The author personally verified the accuracy of every reference before using it. Data analysis, interpretation of the results, and the discussion were entirely the author's own work. Artificial intelligence did not participate as a co-author.

References

1. United Nations Office on Drugs and Crime. World drug report 2024 [Internet]. Vienna: UNODC; 2024 [cited 2025 Sep 1]. Available from: https://www.unodc.org/unodc/en/data-and-analysis/world-drug-report-2024.html

2. Office of the Narcotics Control Board. Thailand narcotics control annual report 2023. Bangkok: ONCB; 2023. (in Thai)
3. Wright TE, Schuetter R, Tellei J, Sauvage L. Methamphetamines and pregnancy outcomes. J Addict Med. 2015;9(2):111-7.
4. Ladhani NN, Shah PS, Murphy KE. Prenatal amphetamine exposure and birth outcomes: a systematic review and meta-analysis. Am J Obstet Gynecol. 2011;205(3):219.e1-7.
5. Chaiwiraphandet J, Kanchanabat S. Prenatal methamphetamine exposure and neonatal outcomes. Vajira Medical Journal. 2016;60(1):53-64. (in Thai)
6. Chomchai C, Na Manorom N, Watanarungsan P, Yossuck P, Chomchai S. Methamphetamine abuse during pregnancy and its health impact on neonates born at Siriraj Hospital, Bangkok, Thailand. Southeast Asian J Trop Med Public Health. 2004;35(1):228-31.
7. Premchit S, Orungrote N, Prommas S, Smanchat B, Bhamarapravatana K, Suwannarurk K. Maternal and neonatal complications of methamphetamine use during pregnancy. Obstet Gynecol Int. 2021;2021:8814168.
8. Namon Hospital. Annual report of maternal and child health services, Namon Hospital, Kalasin Province, fiscal years 2021-2023. Kalasin: Namon Hospital; 2023. (in Thai)
9. Weiss ME, Piacentine LB. Psychometric properties of the Readiness for Hospital Discharge Scale. J Nurs Meas. 2006;14(3):163-80.
10. Weiss ME, Piacentine LB, Lokken L, Ancona J, Archer J, Gresser S, et al. Perceived readiness for hospital discharge in adult medical-surgical patients. Clin Nurse Spec. 2007;21(1):31-42.
11. Ritklar L. Results of discharge planning by using D-METHOD on re-admission and satisfaction in patients with coronary artery disease. Thammasat Univ Hosp J Online. 2018;3(3):19-27. (in Thai)
12. Gordon M. Manual of nursing diagnosis. 12th ed. Sudbury (MA): Jones and Bartlett; 2010.
13. World Health Organization. Guidelines for the identification and management of substance use and substance use disorders in pregnancy. Geneva: WHO; 2014.
14. Kemmis S, McTaggart R. The action research planner. 3rd ed. Geelong: Deakin University Press; 1988.
15. Polit DF, Beck CT. Nursing research: generating and assessing evidence for nursing practice. 11th ed. Philadelphia: Wolters Kluwer; 2021.

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